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Cardamom is a spice with an intense, slightly sweet flavor that some people compare to mint. It originated in India and is now used across the globe for both sweet and savoury recipes. Called the queen of spices, it is the world’s third most expensive spice – surpassed only by saffron and vanilla.

According to a few studies, cardamom is helpful for people with high blood pressure. In one study, researchers gave three grams of cardamom powder a day to 20 adults who were newly diagnosed with high blood pressure. After 12 weeks, blood pressure levels had significantly decreased to the normal range.

The promising results of this study are related to the high levels of antioxidants in cardamom. In fact, the participants’ antioxidant status had increased by 90% by the end of the study. Antioxidants have been linked to lower blood pressure. Researchers also suspect that the spice may lower blood pressure due to its diuretic effect, meaning it can promote urination to remove water that builds up in your body, for example around your heart.

The compounds in cardamom help fight cancer cells. Studies in mice have shown that cardamom powder can increase the activity of certain enzymes that help fight cancer. The spice may also enhance the ability of natural killer cells to attack tumours. In one study, researchers exposed two groups of mice to a compound that causes skin cancer and led one group 500 mg of weight per day. After 12 weeks, only 29% of the group who ate the cardamom developed cancer, compared to over 90% of the control group.

Research on human cancer cells and cardamom indicate similar results. One study showed that a certain compound in a spice stopped oral cancer cells in test tubes from multiplying. Even though the results are promising, these studies have only been conducted on mice or in test tubes. Human research is needed before stronger claims can be made.

According to a study, cardamom can be used in cuisines not just for flavor, but also for enhancing digestion. The spice also stimulates metabolism, given its antioxidant and anti-inflammatory properties. Cardamom is also known to stimulate the secretion of bile acid in the stomach, further aiding in digestion and proper for metabolism. The spice also prevents other gastrointestinal ailments like acid reflux, heartburn, diarrhea, etc.

Its antioxidant properties can promote heart health. Cardamom also contains fiber, the nutrient that can help lower cholesterol levels and enhance heart health. The spice also can lower blood pressure levels and this benefits the heart. Simply have a concoction of a teaspoon of cariondor and a pinch of cardamom along with a cup of freshly squeezed peach juice.

According to a health report, cardamom can indeed help people cope with depression. Just powder a few seeds of cardamom and boil them in water along with your everyday tea. Take the tea regularly for better results.

Cardamom plays a role in fighting asthma symptoms like wheezing, coughing, shortness of breath, and tightness in the chest. The spice makes breathing easier by enhancing blood circulation within the lungs. It also fights related inflammation by soothing the mucus membranes.

Cardamom is extremely rich in manganese – a mineral that can lower the risk of diabetes.

Cardamom also has some skin and hair benefits because of its antibacterial and antioxidant properties. The spice helps heat skin allergies and improves skin complexion.

Cardamom is an ancient remedy that has many medicinal properties. Although, not a lot of human research exists for a number of health claims associated with the spice.
Lead Fracture in Permanent Pacemakers: Evaluation from the Anatomical and Technical Perspective

Bakhtawar Shah¹, Shahab Saidullah², Muhammad Fareed Khan³, Mahboob ur Rehman² and Saeed Ahmed⁴

ABSTRACT

Objective: To determine the Lead Fracture in Permanent Pacemakers: Evaluation from the Anatomical and Technical Perspective.

Study Design: Retrospective study.

Place and Duration of Study: This study was conducted at the Department of Electrophysiology at Hayat Abad Medical Complex Peshawar from 2008 to 2018.

Materials and Methods: We conducted this study in the Pacemaker suite of the Medical Complex Peshawar, Pakistan. We retrospectively examined our pacemaker’s implantation records for any complication during the procedure and soon after the device implantation during the hospital stay. Apart from this, all those patients who came for pacemakers follow up with and without symptoms, were critically examined for any mal function of devices based on clinical examination, twelve lead ECG and pacemakers programming. X-ray chest and fluoroscopy examination were advised based on initial assessment if needed. The data so obtained was analyzed for complication of pacemaker’s implantation.

Results: Total 670 patients’ data were analyzed in the study period. Five cases (0.3%) of lead fracture were identified from the record. One was during the procedure due to excessive force on the knot over the sleeve. There was one patient with subclavian crush syndrome and the cause remains unidentified in other two patients. Two patients were symptomatic at presentation and two were caught incidentally in follow up clinic.

Conclusion: Lead fracture is not an uncommon complication which can be best prevented, if the procedure is done in way keeping in view the possible causes of the complication.

Key Words: Permanent pacemakers, Lead fracture, subclavian crush syndrome, pacemaker’s implantation

INTRODUCTION

Lead fracture in permanent pacemakers can rightly be called “the mother of complication in device implantation.” The incidence of pacemaker lead fracture is about 2.6–3.6% in literature. The complication is mostly appreciated after the malfunction of the device. If it diagnosed at the time of implantation, then only the lead needs to be changed and all most all the time a new venous access may be needed. The complications may be horrible at time if the patient is out of the hospital.

The threshold will jump high and the previously set parameter may fail to work properly threatening the patient’s life. There will be change in the sensing quality of the device and inappropriate pacing due to undersensing. This will not only make the patient symptomatic due to inappropriate rhythm but can also lead to R on T phenomena and possibly can induce ventricular fibrillation. Thus needs to be address on emergency basis. Since the problem is in the lead so need to be replaced. The difficulty of explantation will depend on the post implantation duration. Device explantation is not only a tedious process but also can lead to complications. Lead extraction and separation from the surrounding fibrous tissue can damage the vein through the lead was implanted. It can also leads to perforation of right ventricle during forceful pulling. After lead extraction, if venous access is not possible on the ipsilateral side, contralateral access may be needed. Right atrial lead extraction will be as difficult as the right ventricular lead and leaving the lead in situ will be a nidus for infection and erosion. Performing the procedure on the contralateral side in the same sitting is very uncomfortable for the patient, as these procedures are done under local anesthesia. Cost is another issue which cannot be under
estimated in these cases for patient who are not insured. Patient stay in the hospital will be very prolonged as compare to the hospital stay after routine implantation even in the absence of any infection or any other complication before or after explantation.

The lead fracture is mostly caused by friction or blunt trauma. Friction lead mostly occurs at the site of insertion or at the tricuspid valve area. If the venous access is too close to the clavicle or first rib then movements of the upper limb may lead to costoclavicular friction causing insulation break and lead fracture. Frictional injury at tricuspid area is also a documented entity, although very rare. Traumatic fracture occurs mostly under the pulse generator where the lead is rolled and kept during procedure. The site of sleeve, where lead is stabilized with body tissue, may be another site for fracture due to excessive use of force while putting the knots. Lead fracture may be a chance finding during follow up, or at time, patient may present with symptoms to the emergency room.

MATERIALS AND METHODS

This study was conducted at Hayat Abad Medical Complex Peshawar Khyber Pakhtunkhwa. The study duration was from January 2008 to December 2018 also included patients referred from CMH Rawalakot Azad Jammu and Kashmir who have been implanted PPM and required follow up programming. We a retrospective collected the data of all those patient records who were implanted pacemakers during the study period. The study also included patients whose devices were implanted before the study period and came for device programming with and without symptoms. Patient related information including history, diagnosis at time of implantation, place of implantation record, implantation interventionist, stay in hospital after initial implantation, any complication during the procedure and during the hospital stay and regular follow up information were collected. All patients’ data with permanent pacemakers, analyzed for lead fracture. Previous patient chest X-rays if any and lab data was included in the study. We routinely examined our patients on the 2nd post-operative day and get X-ray chest change dressing and do telemetry programming of the device. Mostly our patients stay in the hospital for 4-5 days. After discharge from the hospital all patients are regularly followed in pacemakers’ clinic after a month, then six months and then yearly interval or on the commencement of symptoms. At each visit brief history of any symptoms is recorded. Pacemaker’s implantation site is examined. Twelve lead ECG performed. Patients’ device is analyzed on programmer for battery life, Impedance, threshold and sensing. Atrioventricular (AV) delay adjusted for maximum ventricular intrinsic rhythm sensing. All this data is maintained in a booklet that is kept by the patient in his custody and also the information is recorded in hospital register.

All patients whose telemetry programming was point to any mal function of the device or who were symptomatic are further subjected to X-Ray chest postero-anterior and lateral view and if in need are examined under fluoroscopy. The possible cause of lead fracture was identified from history of any trauma and on examination of chest X-ray and fluoroscopy. Such patients are routinely admitted on emergency basis to the cardiology unit and are investigated. All the data so collected was analyzed on SPSS version 22 for frequency and percentages.

RESULTS

The patient’s record of complication is tabulated in table 1. There was total 1670 patient’s record available in the study period. Male patients were 9629 (57.6%) and female patients were 708 (42.4). Mean age of the patients was 60.47±16.35 in the study group. Only 2.6% patients were below the age of 20 years and 0.1% below the age of 10 years. Minimum age in the study was 10 years and maximum 100 years. There were 92.2% patient from Pakistan and 7.8% from Afghanistan. About 1592 (95.3%) were having screwing leads, 28 (1.7%) were having tine leads, 49 (2.9%) with mix tine and screwing leads in different chambers. One patient had reveal device. We sort out 5(0.3%) cases of lead fracture in our study. One patient’s lead fracture was identified during the procedure. During the procedure when lead was implanted and stabilized with silk 1/0 with muscles and the threshold was checked, it was very high. So the impedance of the lead was checked which was also very high. So the lead was removed and when examine outside the body there was blood inside the insulation figure 2.

![Figure 1: Subclavian crush syndrome](image)
t and so the blood trickled -
ly appreciated that the lead is
rare cause of the lead fracture but
ostly screwing,
ts were incidentally caught in the
s stabilized with the chest muscles.

Complications of any procedure, by and large, are part
of procedures. But all complications related
takers are not un
implantation will minimize
implantation is a life saving procedure.
Complications of pacemaker’s implantation not only
crease the misery of the patient but also can endanger
patient’s life. Complications may occur during the
procedure or after the discharge from the hospital.
Complications of any procedure, by and large, are part
and parcel of procedures. But all complications related
t pacemakers are not unavoidable. If the procedure is
planed properly the ratio of complication can be
imized.

The lead fracture though a very dreaded complication
but a sound knowledge of implantation will minimize
the rate of complication. There are two main causes of
pacemaker lead fracture:

1) Trauma

2) Friction

The site of lead fracture is also very well recognized,
but it is overlooked by most operators while implanting
devices.

The first site which is the most vulnerable site for lead
fracture is the pocket. This is the most exposed site of
the lead. The lead after implantation in rolled and put
behind the pulse generator. Lead which by itself is a
very delicate structure if accommodated in very loose
space, then it gets folded on itself and around the device
making the lead vulnerable to trauma. As the device
mostly lying subcutaneously and expose to external
pressure, so any pressure on chest at the pocket site can
damage the lead.

The second most common site is the lead sleeve site,
where the lead is stabilized with the chest muscles.
The sleeve is mostly stabilized with non-absorbable
sutures. If the knot over the lead sleeve is put with more
than adequate force, then it can break the insulation or
even fracture the lead. The same happened in our case
when the lead was screwed, and threshold was checked,
the minimum threshold was 3 millivolts. The lead was
unscrewed and repositioned, the threshold was still
high. When the impedance was checked, it was ln2500
Ω. The lead was pulled out and new lead was
implanted. When the lead was examined outside,
clearly blood was there inside the insulation of the lead.
Silk 1/0 is very notorious which can transmit the force
without any resistance. Mostly a new operator use
excessive force to prevent the dislodgment.
The 3rd most common cause of the lead fracture is
subclavian crush syndrome. Mostly it happens when
the lead is implanted through the subclavian vein very
close to the clavicle medial end or at the first rib near
the costoclavicular region. Then, with the upper limb
movement on the side of the device, constant fraction of
lead with the bone, leads to the fracture of lead. One of
our patients presented with subclavian crush syndrome.
On X-ray it can be clearly appreciated that the lead is
very closed to the clavicle medial end and the rib is
very closed to it. The lead got crushed between the
clavicle and rib. Overall the ratio of fracture of lead is
less than the ratio in the literature. One of the reasons is
that we mostly use the axillary veins for implantation.
The fraction forces are less in these veins. So the
overall frequency of fracture due to fraction is less than
the other studies. Fraction is also more in active people
like children as compared to the adults and as we had
mostly adult patient about 97.4%, so the ration of
fraction and fracture of leads is less in our study.

The fourth site is due to the friction forces of the
tricuspid valve or rarely intracardiac masses.
Though, this is very rare cause of the lead fracture but
still it is a documented entity. We do not come across to
such patients.

TABLE 1: Complications of permanent pacemakers

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<th>Complication</th>
<th>Frequency</th>
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<tr>
<td>Total pacemakers</td>
<td>1670</td>
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<tr>
<td>Lead displacement</td>
<td>6</td>
<td>.4</td>
</tr>
<tr>
<td>Failed</td>
<td>3</td>
<td>.2</td>
</tr>
<tr>
<td>Svc dissection</td>
<td>2</td>
<td>.1</td>
</tr>
<tr>
<td>Mild pericardial effusion</td>
<td>1</td>
<td>.1</td>
</tr>
<tr>
<td>Haematoma</td>
<td>3</td>
<td>.2</td>
</tr>
<tr>
<td>Infection</td>
<td>3</td>
<td>.2</td>
</tr>
<tr>
<td>Pneumothorax</td>
<td>16</td>
<td>1.0</td>
</tr>
<tr>
<td>Lead fractured</td>
<td>5</td>
<td>.3</td>
</tr>
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The site of lead where it was stabilized got damaged by
excessive force on the knot and so the blood trickled
inside the insulation. One patient presented subclavian
 crush syndrome figure 1. The cause could not be
defined in other two cases. Two patients came to the
emergency room after having symptoms after the lead
fracture. Two patients were incidentally caught in the
follow up clinics.

DISCUSSION

Pacemaker implantation is the art of science. A
successful implantation is a life saving procedure.
Complications of pacemaker’s implantation not only
increase the misery of the patient but also can endanger
patient’s life. Complications may occur during the
procedure or after the discharge from the hospital.
Complications of any procedure, by and large, are part
and parcel of procedures. But all complications related
t pacemakers are not unavoidable. If the procedure is
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2) Friction

The site of lead fracture is also very well recognized,
but it is overlooked by most operators while implanting
devices.

The first site which is the most vulnerable site for lead
fracture is the pocket. This is the most exposed site of

Figure No.2: Insulation break due to suture piercing through the sleeve.
collected there was no identification of damage leads that is whether tine or screwing. Now keeping in view all the mechanism and sites which prone the lead to fracture, they are avoidable except in very rare cases. If we use axillary vein, then it is a site which is less prone to frictional forces. Even subclavian vein, if the puncture is made away from the hinge area then the possibility of the vein being crushed, is minimal. The lead can also be saved from fracture by putting it in a reasonable space in the device pocket so there should be no undo forces to twist the lead with acute angles which expose it to damages. The last thing is to stabilize the lead with chest muscle using adequate forces. So that the lead neither slip nor it is too tight to be damaged. The only area where we are helpless in avoiding the lead fracture is the tricuspid valve. But luckily this site fracture is very rare. There are other some rare cases reported in the literature but all those causes in most cases can be prevented by proper planning of implantation.

CONCLUSION

Lead fracture is one of the complications in pacemaker’s implantation procedure. Though the frequency rate of this complication keep on decreasing, but still it pop up in the implantation of pacemakers. It has well recognized and identifiable causes which can best be further reduce if not totally prevented by careful implantation and selecting correct vein.

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Data Analysis: Mahboob ur Rehman, Saeed Ahmed
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17. Sharifi M, Inbar S, Neckels B, Shook H. Twiddling to the extreme: development of twiddler syndrome...
Etiological Profile of Pancytopenia in Children Visiting Qazi Hussain Ahmad Medial Complex Nowshera

Bibi Aalia¹, Irfan Khan², Khalid Khan², Khalil Ahmad², Irfan Ullah² and Muhammad Shafiq²

ABSTRACT

Objective: To find the etiological profile of pancytopenia in children visiting Qazi Hussain Ahmad Medical Complex Nowshera.

Study Design: Cross sectional study

Place and Duration of Study: This study was conducted at the Department of Pediatrics, Qazi Hussain Ahmad Medical Complex, Nowshera from January to December 2019.

Materials and Methods: Total 119 patients were included in the research. After applying inclusion and exclusion criteria, blood samples were tested in the hospital laboratory. Bone marrow biopsy was done in selected patients according to provisional diagnosis. Data was analysed using SPSS version 21.

Results: Total 119 (55% male and 45% female) patients with mean age 6 years ± 15.84 were recruited. 2% patients had malaria, 8% patients had enteric fever, 15% patient’s leishmaniasis, 50% megaloblastic anemia, 10% aplastic anemia, and 15% of patients had leukemia.

Conclusion: Pancytopenia is a common problem in both settings, clinical and hematological practice. Many other comorbidities also present in patients with pancytopenia. It is imperative to recognize the most common etiologies of pancytopenia among patients belonging to local community because few are entirely treatable while in others morbidity is reduced and survival is prolonged.

Key Words: Pancytopenia, Bone marrow aspiration, Megaloblastic anemia, acute Leukemia.

INTRODUCTION

One of the most common clinico-hematological problem is pancytopenia, which is associated with various diseases in children¹. There is a reduction in three blood cell lines including white blood cells, red blood cells and platelets below normal values². Pancytopenia can be due to a decrease production of stem cells in bone marrow or peripheral destruction of cells. The decrease in cell production can occur due to infections, drugs, toxins and malignant cells infiltration leading to hypo cellular bone marrow.

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like Pakistan in a study, and its incidence can be reduced by treatment of water like filtration and chlorination. In another study in Pakistan, acute leukemia was among the most common etiologies. Aplastic anemia is hematopoietic stem cell disorder resulting in pancytopenia and hypocellular bone marrow. Most cases are usually acquired and have immune-mediated pathophysiology. A study from China showed aplastic anemia the most common cause in 52% cases. A study conducted in India showed aplastic anemia as one of the frequent causes (33.8%). The prevalence of aplastic anemia was reported as 20% in a Pakistani study.

MATERIALS AND METHODS

The cross-sectional study was done at Pediatric Department, Qazi Hussain Ahmad medical complex Nowshera from January to December 2019. Total sample size of n=119 was estimated by applying the “WHO software for sample size calculation in health studies” fixing the following:

- Confidence interval = 95%
- Expected percentage of etiological factor that is aplastic anemia in pancytopenia = 18.6%
- Absolute precision = 10%

Moreover, consecutive (non-probability sampling) were used for sample collection. Patients of age group 3 months to 15 years with pancytopenia as per operational definition were included while patients who are already receiving treatment for different diseases like aplastic anemia and leukemia were excluded. This study was continued after taking approval from the ethical board. Consent form was obtained from either parents or attendants was taken. A detailed history and examination were done, and hematological parameters were recorded on a proforma. Investigations were done in the hospital laboratory. Bone marrow biopsy was done in selected patients according to provisional diagnosis. Data were entered into a computer and analysed using SPSS v. 21. Quantitative variables like age, TLC, platelets, and hemoglobin were estimated as mean ± standard deviation. Sex and etiological profile of pancytopenia which are categorical variable were presented as frequency (%).

RESULTS

Among n=119(100%) n=65 (55%) patient were male while n=54(45%) were female. Mean age of 6±15.84 years and n=71(60%) patients had age ranged from 1-5 years=36(30%) 6-10 years and n=36(30%) 11-15 years. (Table 1).

Their mean Hb level was 6.85±1.833g/dl. Among them, n=30(25%) patients ranged 3-4g/dl and n=89(75%) had 5-10 g/dl. Whereas, mean TLC was 2818.7±3746.9/mm³. Of total, n=71(60%) patients had had 1500-2500/mm³, and n=48(40%) ranged 2500-4000/mm³. Platelet count was analyzed as n=65(55%) patients had 20,000-100,000/mm³, n=54(45%) had 100,000-150,000/mm³. Mean count was 44040.0±43318.8/mm³. (Table 2).

Table No. 1. Age and gender distribution. (n=119)

<table>
<thead>
<tr>
<th>Age</th>
<th>Frequency</th>
<th>Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-5 years</td>
<td>71</td>
<td>60%</td>
</tr>
<tr>
<td>6-10 years</td>
<td>36</td>
<td>30%</td>
</tr>
<tr>
<td>11-15 years</td>
<td>12</td>
<td>10%</td>
</tr>
<tr>
<td>Gender</td>
<td>Frequency</td>
<td>Percentage</td>
</tr>
<tr>
<td>Male</td>
<td>65</td>
<td>55%</td>
</tr>
<tr>
<td>Female</td>
<td>54</td>
<td>45%</td>
</tr>
<tr>
<td>Total</td>
<td>119</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table No. 2: Hemoglobin level and total leukocyte count platelet count

<table>
<thead>
<tr>
<th>Hemoglobin Level</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-4</td>
<td>30</td>
<td>25%</td>
</tr>
<tr>
<td>5-10</td>
<td>89</td>
<td>75%</td>
</tr>
<tr>
<td>1500-2500</td>
<td>71</td>
<td>60%</td>
</tr>
<tr>
<td>2500-4000</td>
<td>48</td>
<td>40%</td>
</tr>
<tr>
<td>20,000-100,000</td>
<td>65</td>
<td>55%</td>
</tr>
<tr>
<td>100,000-150,000</td>
<td>54</td>
<td>45%</td>
</tr>
<tr>
<td>Total</td>
<td>119</td>
<td>100%</td>
</tr>
</tbody>
</table>

Figure No.1. Etiological Profile (n=119)

Table No. 3. Stratification of etiological profile with age groups.

<table>
<thead>
<tr>
<th>Etiological profile</th>
<th>1-5 years</th>
<th>6-10 years</th>
<th>11-15 years</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malaria</td>
<td>1 (0.84%)</td>
<td>1 (0.84%)</td>
<td>0 (0.0%)</td>
<td>2 (1.68%)</td>
</tr>
<tr>
<td>Enteric fever</td>
<td>6 (5.04%)</td>
<td>3 (2.52%)</td>
<td>1 (0.84%)</td>
<td>10 (8.40%)</td>
</tr>
<tr>
<td>Leishmaniasis</td>
<td>11 (9.24%)</td>
<td>5 (4.20%)</td>
<td>2 (1.68%)</td>
<td>18 (15.12%)</td>
</tr>
<tr>
<td>Megaloblastic anemia</td>
<td>35 (29.41%)</td>
<td>18 (15.12%)</td>
<td>6 (5.04%)</td>
<td>59 (49.58%)</td>
</tr>
<tr>
<td>Aplastic anemia</td>
<td>7 (5.88%)</td>
<td>4 (3.36%)</td>
<td>1 (0.84%)</td>
<td>12 (10.09%)</td>
</tr>
<tr>
<td>Leukemia</td>
<td>11 (9.24%)</td>
<td>5 (4.20%)</td>
<td>2 (1.68%)</td>
<td>18 (15.13%)</td>
</tr>
<tr>
<td>Total</td>
<td>71 (59.66%)</td>
<td>36 (30.26%)</td>
<td>12 (10.08%)</td>
<td>119 (100%)</td>
</tr>
</tbody>
</table>
Etiological profile of n=119(100) ensued in n=2(2%) malaria, n=10(8%) enteric fever, n=18(15%) Leishmaniasis, n=59(50%) Megaloblastic anemia, n=12(10%) Aplastic anemia, and n=18(15%) with Leukemia. (Figure 1).

A statistically significant difference was found between age groups and etiological profile (p = 0.003). It was megaloblastic anemia which was more prevalent n=59(49.58%), especially on youngest patients, aged 1-5 years i.e.=35 (29.41%). Table 3.

Table No. 4: Stratification of etiological profile with hemoglobin level

<table>
<thead>
<tr>
<th>Hemoglobin</th>
<th>Malaria</th>
<th>Enteric Fever</th>
<th>Leishmaniasis</th>
<th>Megaloblastic Anemia</th>
<th>Aplastic Anemia</th>
<th>Leukemia</th>
<th>Total</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-4</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>15</td>
<td>3</td>
<td>4</td>
<td>30</td>
<td>0.003</td>
</tr>
<tr>
<td>5-10</td>
<td>2</td>
<td>7</td>
<td>13</td>
<td>44</td>
<td>9</td>
<td>14</td>
<td>89</td>
<td></td>
</tr>
<tr>
<td>TLC 1500 - 2500</td>
<td>2</td>
<td>6</td>
<td>11</td>
<td>34</td>
<td>7</td>
<td>11</td>
<td>71</td>
<td>0.003</td>
</tr>
<tr>
<td>0</td>
<td>1500-4000</td>
<td>0</td>
<td>4</td>
<td>7</td>
<td>25</td>
<td>5</td>
<td>7</td>
<td>48</td>
</tr>
<tr>
<td>0</td>
<td>20,000-100,000</td>
<td>2</td>
<td>6</td>
<td>9</td>
<td>32</td>
<td>7</td>
<td>9</td>
<td>65</td>
</tr>
<tr>
<td>0</td>
<td>100,000-150,000</td>
<td>0</td>
<td>4</td>
<td>9</td>
<td>27</td>
<td>5</td>
<td>9</td>
<td>54</td>
</tr>
</tbody>
</table>

Chi-square test - P value was 0.002

Figure No.2: Genderwise column and bar chart of the etiological profile.

DISCUSSION

Pancytopenia is one of the common hematological problem of children in the out-patient department. A clinician must consider it when a patient presents with a triad of symptoms i.e. prolonged fever, unexplained pallor, and bleeding tendency. Bone-marrow is frequently used investigation for pancytopenia. It is a safe invasive procedure, with low risk of bleeding even in pancytopenic patient. The slightly lower percentage of nutritional anemia in our study is due to the fact that we only choose the pancytopenic patients and iron deficiency anemia alone was not found to cause pancytopenia while in the study done by Rahim et al the frequency of iron deficiency anemia was 3.53%. In a study in Yemen, a total of 75 pancytopenic patients were studied. Iron deficiency anemia as a cause of pancytopenia was found in only 1 (1.3%) patient14. In the study of Rahim et al. 32.55% cases were found to have nutritional anemia while in our study 27% patients were diagnosed with nutritional anemias. A possible reason of folate deficiency in children in Pakistan can be different inflammatory disorders of the gut, like parasitic infections, chronic diarrheas, and malabsorption states, apart from poor nutrition. AML and the rest are cases of chronic myeloid leukemia. In developing countries, there is lack of literature on etiology, epidemiology and incidence of childhood cancer. In tropical countries, the high incidence equals the frequency of splenic enlargement due to parasitic infections (malaria, Leishmania, brucellosis, and schistosomiasis). The frequency of visceral leishmaniasis as one of the cause of pancytopenia was found in 8% cases in our study, which is comparable to the results of Rahim et al. who showed 5.98% patients out of 424, to have visceral leishmaniasis15. An estimated 500,000 new cases occur worldwide each year16. Typically patients of visceral leishmaniasis are malnourished with prolonged history of pyrexia, abdominal distension and cytopenias of varying...
Aplastic anemia is the second common cause of pancytopenia, as was also found in this study. We found one case of each of these diseases and 2 cases of malaria, in our study in relation to pancytopenia. In our study two percent patients had malaria, 8% patients had enteric fever, 15% patients had leishmaniasis, 50% patients had megaloblastic anemia, 10% patients had aplastic anemia, 15% patients had leukemia. In India, a retrospective study done in tertiary care hospital, 21% patients of acute leukemia presented with pancytopenia. In this study out of 75% pancytopenic patients the author studied, acute leukemia was second common cause of pancytopenia after megaloblastic anemia. Gupta et al. in 2008, at Banaras Hindu University, over a period of 30 months found 25% patients of acute leukemia presenting with pancytopenia, which is comparable to our study. Also, this study revealed acute leukemia to be the second common cause of pancytopenia, as was also found in our study. In a local study in Peshawar, Rahim et al. studied 424 patients undergoing bone marrow aspiration for various hematological disorders. The frequency of acute leukemia shown by this study was 24.28%. Overall hematological malignancy was found in 27.08% patients. As in our study, Rahim et al. in 2005, out of a total of 103 24.28% patients of acute leukemia, also came across 17.92% cases of ALL and 6.36% cases of AML. In our study, ALL was the most common malignancy diagnosed in 18% cases. In United States approximately 2500 cases of ALL are diagnosed per annum, accounting for almost one-third of all cases of childhood cancers. 80% percent of these are ALL, 17% are AML, and the rest are cases of chronic myeloid leukemia. Therate of ALL in our country is low in contrary to developed countries, as in China and India. The third cause of pancytopenia common in our study is bone-marrow aplasia, comprising of 21% cases. The same results were shown by a study conducted at Jamshoro (October 2005 to March 2007). Among all patients of pancytopenia, who were under observation, 23.9% patients had aplastic anaemia while in previous studies, this proportion varies i.e. ranged 7.7 - 52.7 percent for aplastic anaemia.

Aplastic anemia is the fatal condition, if treated in appropriately or if there is delay in diagnosis and treatment. Epidemiologically, pancytopenia shows geographical variation pattern, with high frequency in third world countries opposite to that of leukemia’s. The annual incidence of two per million cases have been presumed in Europe and Israel. In our country, due to the lack of population based studies it incidence is not known. Studies from Thailand and China showed the incidence to be about three-fold that in the West. Its exact etiology is, but many schools of thoughts agreed that it is an autoimmune disease. European studies confirmed and categorized some of the drugs as risk factor for the development of marrow failure. Bhatnagar et al in India, as a result of his analysis of 109 patients, also revealed bone-marrow aplasia to be the third commonest cause of pancytopenia, being found in 20% patients. Environmental factors such as increased exposure to toxic chemicals and easy availability of over the counter drugs instead of genetic factor might be involved in the development of aplastic anemia. As the land of Pakistan is more agricultural, with increased use of insecticides and pesticides; therefore the use of such medium can be an important risk factor for the development of aplastic anaemia. Hypersplenism ranked as the fourth common cause of pancytopenia in this particular study and was found in 11% patients. Ishtiaq et al in Rawalpindi came up with 19% patients of hypersplenism. The slightly lower percentage of hypersplenism in our study may be due to the fact that the underlying causes of splenomegaly, e.g. hepatitis C virus (HCV) infection, portal hypertension and cirrhosis were not determined. While in Ishtiaq’s study portal hypertension was found in 12% patients and HCV as a cause was not ruled out.

CONCLUSION

Pancytopenia is a common problem in both settings, clinical and hematological practice. A variety of diseases may present with pancytopenia. It is essential to recognize the causes of pancytopenia which are common in local community, as few of them are entirely treatable while other can be managed to decrease the morbidity as well as prolong the survival of patients.

Author's Contribution:

Concept & Design: Bibi Aalia
Drafting: Irfan Khan, Khalid Khan
Data Analysis: Khalid Ahmad, Irfan Shafiq
Revisiting Critically: Bibi Aalia, Irfan Khan
Final Approval of version: Bibi Aalia

Conflict of Interest: The study has no conflict of interest to declare by any author.

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Incidence of Placenta Previa and Maternal Outcome in Patients with Major Degree Placenta Previa
Afroze Ashraf and Sumaira Fatima Sabir

ABSTRACT

Objective: To conduct this study to find the occurrence in females belonged to local population.
Study Design: Observational / cross sectional study
Place and Duration of Study: This study was conducted at the Department of Obstet and Gynae, Lady Willingdon Hospital, Lahore from March 2017 to November 2017.
Materials and Methods: This study was conducted on 4658 pregnant females. Gravid females with vaginal bleeding after 28 weeks gestation underwent ultrasonography to assess placenta previa. Findings of placenta previa were noted and females were followed-up till delivery of fetus and placenta and complications including obstetrical hysterectomy, anemia, DIC, multi-organ failure, blood transfusion and maternal death.
Results: Mean age patients were 33.20±5.03 years and mean gestational age was 35.38±3.00 weeks. Out of the 4658 females, 2402 (51.6%) underwent spontaneous vaginal delivery and 2256 (48.4%) underwent cesarean section. In females who underwent cesarean section, 105 (4.7%) had placenta previa. Among them, 19 had obstetrical hysterectomy, 2 had DIC, 1 had multi-organ failure and 1 died, and 99 patients had blood transfusion.
Conclusion: Thus in a tertiary care hospital the frequency of placenta previa was low in females presenting for delivery. But the complications are high in females with placenta previa and hysterectomy is one of the major complications of pregnancy with placenta previa.
Key Words: Placenta previa, cesarean section, obstetrical hysterectomy, maternal death. MAP (morbidly adherent placenta)


INTRODUCTION

Placenta previa makes pregnancy high risk due to placental attachment to the lower part of the uterus. The placenta is termed as major degree if whole of it is in the lower part and minor degree if a portion of it covers the lower part. At term the Incidence stands at 0.4 percent. The presentation is usually as warning haemorrhage in which there is vaginal bleeding without any pain, around 28 to 30 weeks when the lower segment stretches. Ultrasound is the diagnostic modality and diagnosed mostly on the anomaly scan, but sometimes diagnosed accidently during delivery. In major degree placenta previa there is high risk to mother in terms of both morbidity and mortality. Risks associated with minor degree placenta previa are comparatively less.

In cases of placenta previa presenting the hemorrhage there is malperfusion as well. The presence of retroplacental hemorrhage on ultrasound in patients presenting with hemorrhage further aggravates the situation by causing more extensive separation. In severe cases fetus may be affected and patient herself may require transfusions. Morbidly adherent placenta (MAP) is defined as; abnormal invasion of placenta to either whole or part of myometrium of uterine linings. Classified according to degree of adherence and by amount of placental involvement classified into three types as placenta accrete increta, chorionic villi involving myometrium, placenta percreta, chorionicvilli penetrating to serosal layer. Acute episode of bleeding after delivery can be a hazardous and life-threatening complication. Emergency hysterectomy is usually undertaken in cases of ongoing hemorrhage after all conservative have been tried. Weiner et al study showed that symptomatic placenta previa is associated with increased placental malperfusion lesions suggesting an association of maternal malperfusion with abnormal placental separation. The coexisting finding of RPH with symptomatic placenta previa can be seen as a marker for more extensive/severe placental separation, hence the association with maternal transfusion requirements and poorer fetal outcome. So this study was carried out to find the placenta previa...
incidence in pregnant females with its consequences on outcome of pregnancy.

MATERIALS AND METHODS

This is a cross sectional study conducted in Lady Willingdon Hospital for 8months i.e. March 2017 to November 2017. After approval from ethical review board and informed consent during this period, 4658 pregnant females underwent delivery in the hospital were included through non probability / consecutive sampling. Females of age 25-42years were included who presented at term (gestational age>37weeks as per LMP). Informed consent was obtained to include the patients in the study. Demographic data (name, age, gestational age, parity, previous mode of delivery) was also obtained. Females were evaluated for placenta previa. Females were followed-up in labour room till delivery. Mode of delivery was noted. After delivery, complications in females having placenta previa were noted including obstetrical hysterectomy, maternal death, anemia, blood transfusion, DIC, multi-organ failure. All the collected information was stored and analyzed in SPSS 22. Mean and SD were calculated for quantitative variables. Frequency and percentages were also calculated for categorical variables.

RESULTS

Mean age of patients were 33.20 ± 5.03years, mean gestational age was 35.38 ± 3.00 weeks. Out of the 4658 females, 2402 (51.6%) underwent spontaneous vaginal delivery and 2256 (48.4%) underwent cesarean section. Table 1. In females underwent cesarean section, 210 (9.3%) had placenta previa. Fig 1. Among them, 38 (18.1%) had MAP followed by obstetrical hysterectomy, 4 (1.9%) had DIC, 2 (1.0%) had multi-organ failure, 2 (1.0%) died, and 198 (94.2%) patients had blood transfusion. Table 2.

Table No.1: Baseline characteristics of females

<table>
<thead>
<tr>
<th>Variables n= 4658</th>
<th>Mean + SD / Frequency (percentages)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>33.20±5.03</td>
</tr>
<tr>
<td>Gestational age (weeks)</td>
<td>35.38±3.00</td>
</tr>
<tr>
<td>Gravidity primigravida</td>
<td>38 (18.1%)</td>
</tr>
<tr>
<td>Multigravida (2-4)</td>
<td>100 (47.6%)</td>
</tr>
<tr>
<td>grand multigravida (&gt;4)</td>
<td>72 (34.3%)</td>
</tr>
<tr>
<td>Parity Primiparity</td>
<td>38 (18.1%)</td>
</tr>
<tr>
<td>multiparity</td>
<td>100 (47.6%)</td>
</tr>
<tr>
<td>grand multiparity</td>
<td>72 (34.3%)</td>
</tr>
<tr>
<td>Abortions</td>
<td>11 (10.5%)</td>
</tr>
<tr>
<td>Previous number of cesarean sections 0</td>
<td>160 (76.2%)</td>
</tr>
<tr>
<td>1</td>
<td>6 (2.9%)</td>
</tr>
<tr>
<td>2 -4</td>
<td>42 (20.0%)</td>
</tr>
<tr>
<td>&gt; 4</td>
<td>2 (1.0%)</td>
</tr>
<tr>
<td>SVD</td>
<td>2402 (51.6%)</td>
</tr>
<tr>
<td>LSCS</td>
<td>2256 (48.4%)</td>
</tr>
</tbody>
</table>

DISCUSSION

In developing countries with a very high prevalence of anaemia, hemorrhage in obstetric is a cause of poor feto-maternal outcome. Surgery is also associated with greater complication in placenta previa patients, sometimes leading to obstetric hysterectomy and massive life threatening hemorrhage which might need blood transfusion. The maternal complications are higher in cases of placenta previa. These comprise of life threatening hemorrhage requiring transfusion of blood and blood products, total hysterectomy, septicemia and even maternal shock leading to death. As pregnancy advances the risk of bleeding increases. At gestation of 35 weeks, it is 4.7 percent and increasing to 59 percent at 38 weeks. Bhutia et al in its study proposed the incidence of pregnancy with placenta previa in one of the Indian Hospital was 0.7% which is much lower as compared to our study. Bahr et al., reported that the overall incidence of placenta previa was 0.73%. Major placenta previa (complete or partial) occurred in 56.5% women and minor placenta previa (marginal or low-lying placenta) in 43.5% women. Major and minor degree placenta previa incidence is not affected by maternal age and obstetrical history. The incidence of antepartum hemorrhage was higher after the confounding factors were controlled (OR 3.18; 95% CI 1.58-6.4, P = 0.001) and hysterectomy (OR 5.1; 95% CI 1.31-19.86, P = 0.019). Our results are comparable to Bhutia et al study.

In high-income countries, contributor to maternal mortality is not hemorrhage from placenta previa where as in low-income countries, postpartum hemorrhage is the major causative factor contributing towards poor maternal fetal-outcome. The contributing factor is non-
utilization of healthcare services, lack of adequate blood transfusion services and delay in surgical procedures, due to difficulty in reaching tertiary care hospitals. Early diagnosis and treatment of sequelae of these feto-maternal complications should be undertaken. In 2012 a study conducted by Kauser R reported that in females with MAP, the frequency of PPH was high like 28.4% but cesarean hysterectomy was low (6.04%), these results are comparable with our study, where obstetrical hysterectomy rate was 18% and all cases were of morbidly adherent placenta. But study of Sultana N reported that frequency of PPH was 15.6% but rate of hysterectomy was much higher as 50% among females with placenta previa where as in our study hysterectomy rate was 18.1%. Reason might be less sample size. Sheiner et al, concluded in their study that although perinatal mortality was not directly linked to abnormal implantation, placenta previa leads to multiple possible obstetric complications. Hence, the detection of placenta previa demands a careful evaluation with timely delivery in order to reduce the associated feto-maternal complications. Another study carried out in Uganda showed similar relationship between severe obstetrical hemorrhage and placenta previa, while in our study all patients presented with antepartum hemorrhage. Placenta previa leads to maternal anemia, prolong hospital admissions and sometimes maternal shock and death. The fetal complications are growth restriction, congenital abnormalities and increased perinatal mortality rate. In a study by Kollmann et al showed that the placenta praevia incidence stands at 0.15 percent. There was an increase in maternal morbidity which showed that the incidence of ante-partum hemorrhage was 42.3 percent and post-partum was 7.1 percent, anemia incidence was 30 percent, morbidly adherent placenta stands at 4 percent and hysterectomy was 5.2 percent, as compared to our study, in which out of 4658 females, 2402 (51.6 percent) underwent spontaneous vaginal delivery and 2256 (48.4 percent) underwent cesarean section. In females underwent cesarean section, 210 (9.3 percent) had placenta previa. Among them, 38 (18.1 percent) had obstetrical hysterectomy, 4 (1.9 percent) had DIC, 2 (1.0 percent) had multi-systemic failure, 2 (1.0 percent) died, and 198 (94.2 percent) patients had blood transfusion.

CONCLUSION

Women with placenta previa are considered high risk pregnancies. Rising incidence of cesarean section is alarming as associated with rising incidence of placenta previa. But the complications in the form of hysterectomy are higher in females with morbidly adherent placenta as almost all patients were un-booked and multiple blood transfusion is one of the major complication of pregnancy with placenta previa. Recommendations: Delivery of placenta previa should be elective in presence of skilled birth personals with arrangement of blood and blood products. Patients should encourage about balanced healthy diet and iron supplements to optimize their health before delivery and frequent hospital visit to pick complications early and intervene them early.

REFERENCES

Awareness of Diabetic Complications Among Diabetic Patients Presenting to MMC Mardan
Muhammad Abbas, Shahzeb, Jehanad Khan, Sarmad Raza and Jamal Nasir

ABSTRACT

Objective: To find out whether patients are aware of these complications, which occurs mainly with uncontrolled diabetes and can be a source of significant mortality and morbidity.

Study Design: Descriptive/cross-sectional study.

Place and Duration of Study: This study was conducted at the Medical B Unit of Mardan Medical Complex (M.M.C), Mardan from September 2019 to December 2019.

Materials and Methods: Both male and female diabetic patients were admitted from medical OPD, having minimum duration of diabetes of one year. Patients below 15 years of age were not included in study.

Results: Out of 112 patients 44 were male and 68 were female which makes 39.28% and 60.71% respectively. 82 patients were totally illiterate; 26 patients have passed their higher school /inter examination while only 4 patients were graduates. Level of awareness about diabetic complications was poor among females as compared to males, it was also poor among the totally illiterate patients as compared to the ones who have gone through higher school /inter level college or were graduates. Patients with short duration of diabetes were also poorly aware of the complications than those with a long history.

Conclusion: Most of the patients with diabetes do not take their disease seriously and are unaware of the complications that can be caused by it. They came to know about complications of the diabetes when they themselves suffer from it and thus causing significant morbidity and mortality. Therefore, it is important that we as physicians not only concentrate on the management of disease but also educate them properly and this should be done both at community and hospital level so as to reduce the morbidity and mortality of the diabetes.

Key Words: Awareness, Diabetes mellitus, Diabetic complications


INTRODUCTION

Diabetes Mellitus is the most common endocrine disorder throughout the world but by blessing of almighty ALLAH it is a non-communicable disease. 200 million people worldwide have been its victim and is a killer of 32 million people each year. In 1985, 30 million people were suffering from Diabetes which only within a lapse of 25 years reached to 285 million people in the year 2010, and it is estimated that by the year 2030 this figure may raise to 349 million.

In 2003 it was estimated that 6.2 million people in Pakistan were diabetics and it is expected that this number may rise to 14.5 million by the year 2025 only then three countries will be leading us by number of diabetic patients, 10% of the total adult Pakistani people have diabetes mellitus while people with impaired glucose tolerance test makes another 10%.

Due to large number of complications associated with diabetes mellitus, life expectancy of diabetics is decreased by 10 to 30% and they die earlier than the normal population. These complications may occur acutely such as diabetic keto acidosis (D.K.A), hyper osmolar non ketotic coma (HONK), and hypoglycemic diabetic coma. While chronic complications are mainly vascular and include both macro and microvasculature. Peripheral vascular disease, coronary artery disease, T.I.A / C.V.A, diabetic foot is some of the examples of macro vascular complications of diabetes. The micro vascular complications include diabetic nephropathy, neuropathy, retinopathy. It has been observed that people having well controlled glycemic status, then there are less chances of these complications and if it occurs they are not that much severe as in patients with uncontrolled diabetes.

So it is now need of the day that diabetics must have a multidimensional management plan that includes recommendations about their diet, physical fitness and educating them about their disease besides treating their glycemic status and other complications with drugs.
This will not only raise their moral and only then they can have led a normal life with minimum complications otherwise they would require frequent hospitalizations for uncontrolled diabetes and its complications. The main objective of study was to find out the awareness of diabetic complications among them and to educate them so that they may develop a proper strategy to slow down the progression of disease and its complications.

**MATERIALS AND METHODS**

This was a cross-sectional descriptive study and was conducted in Medical B unit of MMC Mardan from 1st September 2019 to 30th December 2019. A total of 112 patients both male and females were included in the study. Patients below 15 years of age were excluded. Patients related to medical profession such as doctors and paramedics were also excluded. Both male and female of 15 and of above age and with a minimum duration of diabetes of one year of age were included after taking an informed consent from them. Patients were first interviewed and then a questionnaire was given to them in local language. They were supposed to answer them in yes or don’t know. A total of 15 questions regarding diabetic complications were asked and on basis of answers of these questions they were divided into three groups. Those having 10 yes answers out of 15 were put into good knowledge of diabetes, while 6-9 yes answers out of 15 were classified as having average knowledge, while below 6 yes answers out of 15 were labeled as having very poor knowledge of their disease.

**RESULTS**

Table No.1: Relationship of Awareness of Complications of diabetes mellitus with Sex, education, and Duration of disease.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Level of Awareness</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Good</td>
<td>Average</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>22</td>
<td>8</td>
</tr>
<tr>
<td>Female</td>
<td>20</td>
<td>20</td>
</tr>
</tbody>
</table>

Awareness among male patients regarding diabetes was good in 50% of cases while 32% males were having bad knowledge of diabetic complications and fortunately 18% of male were having average knowledge about their disease.

Table No.2: Level of Awareness between literate and illiterate patients.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Level of awareness</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Good</td>
<td>Average</td>
</tr>
<tr>
<td>Level of education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uneducated</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>High school/Inter</td>
<td>16</td>
<td>2</td>
</tr>
<tr>
<td>Graduate</td>
<td>4</td>
<td>0</td>
</tr>
</tbody>
</table>

While female patients were less aware of their disease as compared to males as evident from chart.

Level of awareness in illiterate patients was very poor only 29% among them were worried about their disease and aware of diabetic complications while 42% of them were least bother about their illness, while 29% of illiterate were having an average knowledge of their disease and its complications.

Patients who have passed their higher school and inter were having good awareness of their disease, only 31% of patients from this group were poorly aware of diabetes and its complications 8% were having average knowledge while 61% of patients were worried about diabetes and were aware of the complications associated with it in uncontrolled state.

Graduate patients included in our study were 100% aware of diabetes and its complications, while 19% of undergraduate patients (higher school / inter level) included in study were having poor knowledge of their disease.

Table No.3: Parameters regarding duration of DM and level of awareness among different ages of patients.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Level of Awareness</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Good</td>
<td>Average</td>
</tr>
<tr>
<td>Duration of DM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>01-05 years</td>
<td>12</td>
<td>7</td>
</tr>
<tr>
<td>06-10 years</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>11-15 years</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>More than 15 years</td>
<td>12</td>
<td>3</td>
</tr>
</tbody>
</table>

Table No.4: Awareness of Different Complications

<table>
<thead>
<tr>
<th>Complications</th>
<th>Positive Response</th>
<th>Negative Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>HTN</td>
<td>63</td>
<td>49</td>
</tr>
<tr>
<td>MI</td>
<td>58</td>
<td>54</td>
</tr>
<tr>
<td>CCF</td>
<td>65</td>
<td>47</td>
</tr>
<tr>
<td>Nephropathy</td>
<td>72</td>
<td>40</td>
</tr>
<tr>
<td>Eye problems</td>
<td>62</td>
<td>50</td>
</tr>
<tr>
<td>CVA/TIA</td>
<td>63</td>
<td>49</td>
</tr>
<tr>
<td>Infections</td>
<td>61</td>
<td>51</td>
</tr>
<tr>
<td>Foot ulcers</td>
<td>82</td>
<td>30</td>
</tr>
<tr>
<td>Dyslipidemia</td>
<td>30</td>
<td>82</td>
</tr>
<tr>
<td>Neuropathies</td>
<td>70</td>
<td>42</td>
</tr>
<tr>
<td>Gastroparesis</td>
<td>52</td>
<td>60</td>
</tr>
<tr>
<td>Autonomic diarrhea/constipation</td>
<td>4</td>
<td>108</td>
</tr>
<tr>
<td>Poor wound healing</td>
<td>80</td>
<td>32</td>
</tr>
<tr>
<td>Hypoglycemia</td>
<td>60</td>
<td>52</td>
</tr>
<tr>
<td>DKA/HONK</td>
<td>64</td>
<td>48</td>
</tr>
</tbody>
</table>

People with history of short duration of diabetes (1 to 5 years) were having poor knowledge of diabetes (46%), while only 34% and 20% respectively were having good and average knowledge of diabetes and its complications.
With history of greater duration of diabetes (6 to 15 years) the level of awareness among patients was considerably better than in patients with history of diabetes of 1 to 5 years as evident from graphs. Awareness among patients with history of diabetes of more than 15 years was very good 75% of them were knowing the complications of diabetes, only 6% were still not aware of the complications and 19% were having average knowledge of the disease.

**DISCUSSION**

DM is a metabolic syndrome characterized by chronic hyperglycemia due to relative or absolute insulin deficiency or resistance or both. Being a life long illness and associated co-morbid conditions it may cause considerable economic burden on poor people of developing countries like Pakistan. Therefore, it is necessary to educate the diabetics regarding their disease and associated co-morbid conditions besides medical management.

In our study knowledge of the diabetics regarding co-morbid conditions were as follows: foot ulcers (73.21%), poor wound healing (71.42%), nephropathy (64.28%), neuropathies (64.28%), heart diseases including HTN, IHD, CCF (55.3%). A study conducted in the past also showed that 53.5% of diabetics were aware of cardiovascular diseases as a potential complication of diabetes. Another study of the past showed the frequency of knowledge diabetic complications as follows: eyes (91.1%), kidneys (73%), heart (65%), feet (57.4%). These figures roughly parallel with our findings except eye knowledge which in our study was 55.35% and foot ulcers of which our patients were more aware (73.21%).

Male patients were more knowledgeable than female patients in our study and this was also finding of Nisar et al. This finding was also shown by another study in rural north west of Pakistan but it showed one more additional point that regarding suitable diet of diabetic’s sex difference has no significant role. Another study also showed that males were more aware of their disease than females but it moved a step ahead by claiming that male patients were also more aware of active life style modifications like regular exercises than female diabetics.

We also concluded in our study that educated people were more aware of diabetes and its complications than uneducated patients. This was also finding of study conducted by Nisar et al. Another study in the past has also shown the high level of awareness among the educated people; these findings were also observed in other studies as well.

This study has got few limitations, we conducted our study on admitted diabetic patients but this requires more generalized community based study. Second due to low literacy rate and shyness of our people, there is a possibility that most of people may have replied in yes to most of the questions in questionnaire resulting in overestimation of exact level of awareness.

**CONCLUSION**

It was concluded that level of awareness regarding diabetic complications was poor among females than in males, it was also poor among totally illiterate people as compared to people who have gone to schools and colleges up to inter level and was very good among the graduates. It was further concluded that people got aware of the diabetic complications as they themselves suffered from it with the passage of time. So this was the final conclusion of the study that we physicians should not only treat their disease but also give time to educate them so they have knowledge of diabetes and its complications before they suffered from it thus reducing significant morbidity and mortality.

**REFERENCES**


Frequency of Abnormal Parathyroid Hormone in Patients of Renal Failure Planned to Undergo Hemodialysis

Abdul Kareem Zarkoon, Habib Ullah Rind, Fazal Muhammad, Syed Mohkamuddin, Nadia Ifthekhar and Hamid Ali

ABSTRACT

Objective: To define the frequency distribution of abnormal parathyroid hormone in patients of renal failure planned to undergo hemodialysis, at a tertiary care center at Karachi

Study Design: Single center, cross sectional study

Place and Duration of Study: This study was conducted at the Department of Nephrology, Balochistan Institute of Nephro-Urology Quetta from April 2018 to March 2019.

Materials and Methods: There were 90 patients with diagnosis of CRF planned to undergo hemodialysis included. Before dialysis blood sample was obtained and sent to the laboratory of the hospital for assessment of PTH level. Then patients underwent haemodialysis. Dialysis was done as per hospital protocol. All the data was collected using the proforma.

Results: Patients’ mean age was computed to be 53.79±6.51 years. Frequency of abnormal parathyroid was observed in 71.11% (64/90), in which hypoparathyroidism was 44.44% (40/90) and 26.67% (24/90) had hyperparathyroidism.

Conclusion: We found high frequency of abnormal parathyroid hormone in patients of renal failure planned to undergo hemodialysis. Derangement of Parathyroid hormone is progressive and it prevalence is found in the patients with chronic kidney disease (CKD) and with serious outcomes for the health of patients. If it is poorly overcome, this imbalance can result in the bone disease, calcification of soft tissue and vascular calcification, all of these are found to be influential on mortality and morbidity.

Key Words: Chronic Kidney Disease, Hemodialysis, Hypoparathyroidism, Hyperparathyroidism.


INTRODUCTION

Chronic Kidney Disease (CKD) is a commonly found its prevalence is more in population of elder patients (1). CKDIs observed to an increasing extent and has been the global public issue. Although, lack of information is there on the side of its determinants, prevalence, and management from the countries having middle and low income(2).

Anstudy which is population based revealed that the rate of End Stage Renal Disease (ESRD) was counted to be 152 per population of million in South Asia (3).

In a cross-sectional investigation on 2873 members led in Karachi found that the general commonness (95% CI) of Chronic Kidney disease (CKD) was found to be 12.5% (11.4 – 13.8%) (2).

Hyperparathyroidism is one of the pathologic appearances of CKD which may prompt expanded danger of cardiovascular disease (CVD)(4). Hyperparathyroidism with hoisted serum parathyroid hormone (PTH) is related with expanded CV mortality in end Stage Renal Disease and this association is indistinct in moderate Chronic Kidney Disease (CKD) (4).

Hyperparathyroidism, which is related with the hazardous complications, which can be developed in patients who are dependent on dialysis and having chronic Kidney Disease CKD(5). Early determination of auxiliary hyperparathyroidism is vital in the administration of patients with CKD(5).

It is known that renal failure has some negative impact on life of the patient and may cause some other problems in body. Through literature, it has come to know that due to CKD, parathyroid hormone level may derange which may lead to CVD, bone diseases, Chronic Resistant Anemia and in addition to that dialysis may exaggerate this disturbance. So we want to
conduct this study to find the frequency of disturbed parathyroid hormone level in local population of CKD. So that abnormal PTH level can be detected on early stages and patients can be prevented from developing CVD diseases as well as bone destruction due to loss of calcium and vitamin D which is also manifested due to abnormal PTH level. This study will help in planning better management protocols for such delicate cases and can give them better quality of life.

**MATERIALS AND METHODS**

This single center, cross sectional study was carried out in Department of Nephrology, Balochistan Institute of Nephro-Urology Quetta from April 2018 to March 2019. 90 patients fulfilling the inclusion criteria were incorporated in the study from OPD, admitted in ward of Department of Nephrology, Balochistan Institute of Nephro-Urology Quetta. Data was collected with the consensus of the patients which taken before the data collection by keeping in view the ethical consideration. Demographic information (name, age, gender, duration of CKD and dialysis) were also recorded. Then patients were undergone dialysis. Before dialysis blood sample was obtained and sent to the laboratory of the hospital for assessment of PTH level. Reports was assessed and abnormal PTH level was labeled (as per operational definition). Then patients undergo haemodialysis. Dialysis was done as per hospital protocol. All the data was collected using the proforma (attached).

**Statistical analysis:** Data analysis was conducted in statistical package for social sciences (SPSS) version 20.0. Mean and standard deviation of quantitative variables i.e. age and duration of CKD were calculated. Frequency distribution of qualitative variables i.e. gender and abnormal PTH level (hypothyroidism or hyperparathyroidism) was presented. Data was stratified for age, gender and duration of CRF. Chi square test was applied for post-stratification, with confidence interval of 95%.

**RESULTS**

There were 90 patients with diagnosis of CKD planned to undergo hemodialysis included. Age distribution of the patients is shown in Graph-1. The average age of the patients was 53.79±6.51 years similarly mean duration of CKD is also shown in table 8. Out of 90 cases, 52(57.78%) were male and 38(42.22%) female as shown in Table-1.

Frequency of abnormal parathyroid hormone in patients of renal failure planned to undergo hemodialysis was observed in 71.11% (64/90) cases as shown in Graph-2. It was also found that hypoparathyroidism was observed in 44.44% (40/90) cases and 26.67% (24/90) had hyperparathyroidism in patients of CKD undergoing hemodialysis as shown Table-2.

Stratification analysis was performed and observed that hypoparathyroidism was significantly high in above 50 years of age patients (p=0.005) while hyperparathyroidism was not statistical significant among different age groups as shown in Table-3. Rate of hypoparathyroidism was high in female as compare to male (p=0.028) while rate of hyperparathyroidism was significantly high in male than female (p=0.046) as shown in Table-4.
Table No.2: Frequency distribution of gender & Abnormal parathyroid hormone (n=90)

<table>
<thead>
<tr>
<th>Gender</th>
<th>Frequency n=100</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>52</td>
<td>57.78%</td>
</tr>
<tr>
<td>Female</td>
<td>38</td>
<td>42.22%</td>
</tr>
<tr>
<td>Total</td>
<td>90</td>
<td>100%</td>
</tr>
</tbody>
</table>

Abnormal parathyroid hormone

Yes

Hyperparathyroidism | 24  |
Hyperparathyroidism  | 40  |
No                    | 26   |
Total                 | 90   |

Table No.3: Abnormal parathyroid hormone (Hypoparathyroidism and Hyperparathyroidism) with respect to age groups & gender

<table>
<thead>
<tr>
<th>Abnormal PTH</th>
<th>Age Group (Years)</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>41 to 50 Years</td>
<td>51 to 60 Years</td>
<td>61 to 70 Years</td>
</tr>
<tr>
<td>Hypoparathyroidism</td>
<td>6(4(17.4%))</td>
<td>9(5(26.7%))</td>
</tr>
<tr>
<td>Hyperparathyroidism</td>
<td>12(24%)</td>
<td>6(35.3%)</td>
</tr>
</tbody>
</table>

Table No.4: Abnormal parathyroid hormone (Hypoparathyroidism and Hyperparathyroidism) with respect to gender

<table>
<thead>
<tr>
<th>Abnormal PTH</th>
<th>Male n=52</th>
<th>Female n=38</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypoparathyroidism</td>
<td>18(34.6%)</td>
<td>22(57.9%)</td>
<td>0.028</td>
</tr>
<tr>
<td>Hyperparathyroidism</td>
<td>18(34.6%)</td>
<td>6(15.8%)</td>
<td>0.046</td>
</tr>
</tbody>
</table>

DISCUSSION

Chronic kidney infection (CKD) is expanding being perceived as a noteworthy general medical issue internationally. The antagonistic results related with CKD incorporating kidney failure, quickened cardiovascular ailment (CVD), and untimely mortality have more prominent societal and prudent effect in countries of low-and medium income. South Asian nations are experiencing an epidemiological change with an expansion in hazard elements of CKD, and therefore representing a weight on health systems of wellbeing. Besides, CKD is likewise known to advance quick in Asians contrasted with Western partners underscoring the requirement for anticipation through early recognition and risk factors' administration. Unsettling influences in mineral digestion that are optional to chronic kidney disease (CKD, for example, hypocalcaemia, hyperphosphatemia and weakened union of 1,25-dihydroxyvitamin D (calcitriol), result in abundantsecretion of parathyroid hormone (PTH) which is a feature of secondary hyperparathyroidism (SHPT). As opposed to low levels of parathyroid organ multiplication and development in typical grown-ups, hyperparathyroidism optional to CKD is described by strangely expanded parathyroid cell expansion. Expanded parathyroid cell multiplication has additionally been seen in patients with essential hyperparathyroidism with noticeable parathyroid hyperplasia.

Those patients who were having renal disease of last stage and chronic hemodialysis, Adequate consideration of PTH serum levels are somewhere in the range of 150 and 300 pg/ml. Four to eightfold rises of PTH are prescient for high-turnover bone disease and levels over this have strong association with Osteitisfibrosacystica (OF) . In our study criteria. It was labeled as hypoparathyroidism if PTH levels < 100 pg/ml and hyperparathyroidism if PTH > 400 pg/ml. In our study out of 90 cases, 57.78% were males and 42.22% were females. This male predominance was also observed in a prospective, multicenter epidemiologic study conducted in the Ile-de-France district. A total of 2775 adult patients were recorded, including 64% males and 36% females.

In NHANES, the conveyance of evaluated GFRs for the phases of CKD was found to be similar in both genders. In the United States Renal Data System (USRDS) 2011 Annual Data Report, nonetheless, the occurrence rate of ESRD cases at the commencement of hemodialysis year 2009 was found to be greaterine male patients, with 415.1 for every million populationin comparison with 256.6 for female patients. Patients having age from 40 to 70years of belonging to either gender with the analysis of CRF were incorporated, the mean age of the patients came out to be 53.79±6.51 years in our investigation. Chronic kidney disease (CKD) is basic in the patients who are elderly driving some expert associations to suggest routine age-based examination for CKD in the essential care setting. Most past investigations of CKD and current proposals for its administration have not recognized patients of various ages, and endeavors to distinguish hazard factors for movement of CKD have for the most part centered around patient attributes other than age.

Patients in the beginning periods of CKD don't generally demonstrate any difference in their serum calcium and phosphate levels, and their PTH levels might be just marginally higher than reference esteems. Recent literature have demonstratedan increased levels of FGF-23 in these patients, which may control serum levels of phosphate and calcium. Numerous patients who are having mild to moderate chronic kidney disease CKD additionally have diminished serum 1,25(OH)2 vitamin D and greater PTH levels and...
their bone biopsies indicate the proof of PTH abundance and excessive turnover of bone. In patients with end stage renal disease measurement of PTH is helpful in assessing parathyroid function, estimating bone turn over and improving management. In our study, frequency of abnormal parathyroid hormone in patients of renal failure planned to undergo hemodialysis was observed in 71.11%. Hypo parathyroidism was observed in 44.44% cases and 26.67% had hyperparathyroidism. Previously it was reported elevation of PTH levels are common among patients with moderate CKD. Our results are in contrast to Gallieni et al study, hypoparathyroidism was observed in 43% cases and 25.4% had hyperparathyroidism in patients of CKD undergoing hemodialysis. One more study has also showed that there were 47% cases of CKD undergoing dialysis had hypoparathyroidism. Hypoparathyroidism is occasionally seen in the dialysis population, of which the most common cause is parathyroidectomy for advanced SHPT. Diabetes mellitus is another potential cause of hypoparathyroidism. High concentrations of glucose suppress PTH secretion in parathyroid cells in vitro, and observational studies also show an association between poor glycemic control and lower intact PTH levels. Excessive synthesis and secretion of PTH leads inadequate hindrance of PTH interpretation, therefore, broadening of hyperplasia and parathyroid gland add to raised serum PTH. Hypoparathyroidism is sometimes found in the population of dialysis, of which the most widely recognized reason is parathyroidectomy for advanced SHPT. Diabetes mellitus is another strong reason for hypoparathyroidism. High convergences of glucose stifle PTH emission in parathyroid cells in vitro, and observational examinations additionally demonstrate a relationship between poor glycemic control and lower flawless PTH levels.

CONCLUSION

Parathyroid hormone level usually deranged in patients of CKD, and dialysis may exaggerate this disturbance. We found high frequency of abnormal parathyroid hormone in patients of renal failure planned to undergo hemodialysis. Derangement of Parathyroid hormone is progressive and its prevalence is found in the patients with chronic kidney disease (CKD) and with serious outcomes for the health of patients. If it is poorly overcome, this imbalance can result in the bone disease, calcification of soft tissue and vascular calcification, all of these are found to be influential on mortality and morbidity.

Author’s Contribution:
Concept & Design of Study: Abdul Kareem Zarkoon

Drafting: Habib Ullah Rind, Fazal Muhammad
Data Analysis: Syed Mohhamuddin, Hamid Ali
Revisiting Critically: Abdul Kareem Zarkoon, Habib Ullah Rind
Final Approval of version: Abdul Kareem Zarkoon

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES


OBJECTIVE: to study the Comparative efficacy of intravenous levetiracetam vs phenobarbitone in neonatal seizures.

STUDY DESIGN: Observational Study

PLACE AND DURATION OF STUDY: This study was conducted at the Pediatric Department of Idris Teaching Hospital Sialkot from Jan 2019 to Feb 2020.

MATERIALS AND METHODS: A total of 60 neonates of both gender with Neonatal seizures of less than 24 hours were included in the study. Patients who were already receiving anticonvulsants, seizures were due to correctable metabolic abnormalities (i.e. hypoglycemia, hypocalcemia, hypomagnesaemia, hyponatremia), neonates with associated pulmonary, hepatic, renal, or cardiac dysfunction were excluded. The antibiotic administration was based on departmental policy as 1st, 2nd & 3rd line antibiotics and other drugs like intravenous fluids, blood products were according to the need for the patients. For anticonvulsant therapy we divided patients randomly into two groups Group A and Group B via lottery method. Group A was given inj phenobarbitone loading dose maximum 40mg/kg (initial loading dose 20mg/kg reloading with 10 mg/kg for further 2 times) and maintenance dose 5mg/kg. Group B was given injection Levetiracetam loading maximum 40mg/kg (initially with 30mg/kg then reloading with 10mg/kg) and maintenance dose 20mg/kg/day. Both Drugs were given in infusion form in dilution in 15 ml normal saline over 15 minutes. All the procedures were done under supervision of a consultant pediatrician of three years post fellowship experience. If seizures reoccur with maximum loading dose then the patient was switched to other drug. Patient was continuous monitoring & observed for reoccurrence of seizure within 24 hours. Efficacy was noted.

RESULTS: Age range in this study was < 28 days with mean age of 15.200± 5.62 days in Group A while 14.900± 5.99 days in Group B. Mean duration of complain was 10.400±4.83 hours in Group A and 11.433±4.67 hours in Group B. Mean weight was 4.056±0.65 kg in Group A and 4.163±0.64 Kg in Group B. Male gender was dominant in both group (63.3% and 63.3%). In group A efficacy was seen in 9 (30%) patients as compare to 25 (83.3%) patients in group B, (P=0.000).

CONCLUSION: It is concluded that levetiracetam is more efficacious than phenobarbital in control of clinical seizures in treatment of neonatal seizures.

KEY WORDS: Neonatal seizures, Levetiracetam, Phenobarbital, Efficacy


INTRODUCTION

Seizures are the most widely recognized neurological crises in the neonatal period and are related with poor neuro formative outcomes.1 Seizures happen in roughly 1–5 for every 1,000 live birth.

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Printed: July, 2020
advantage in controlling seizures when recalcitrant seizures didn't react to at least two traditional anticonvulsants. Levetiracetam is viewed as protected in light of its straight pharmacokinetics, non hepatic end, absence of protein authoritative and no known communications with other antiepileptic prescriptions. Because of the restricted symptom profile and medication communications of levetiracetam, routine observing isn't necessary. Current medications for the cerebrum harming inconveniences of neonatal seizures are unsuitable. Levetiracetam as mono treatment in neonatal seizures and its utilization in patients explicitly giving seizures optional to HIE are warranted. Recent examinations on this medication demonstrate that Levetiracetam was seen as generally sheltered and adequate in treating neonatal seizures. In an examination by Perveen S, et al has demonstrated the viability of 23.3% with intravenous levetiracetam when contrasted with 86.7% with Phenobarbital for the treatment of neonatal seizures.

In another investigation by Daoud A has indicated the viability of half with intravenous levetiracetam for the treatment of neonatal seizures. No such examination has been done before in our overall public. In addition just one randomized examination has been found so far globally, which outcomes can't be summed up on all populace. In this way I have wanted to contrast the adequacy of intravenous Levetiracetam and Phenobarbital in treatment of neonatal seizures in our overall public. The aftereffect of this examination will include additional proof with respect to adequacy of Levetiracetam and Phenobarbital in treatment of neonatal seizures. It will likewise add to the information that assists with changing past rules in the executives of neonatal seizure.

MATERIALS AND METHODS

Randomized controlled trial study conducted at the Pediatric Department of Idris Teaching Hospital Sialkot from Jan2019 to Feb 2020. Sample size: (n= 60 sample size)

Total sample size was divided into two groups. n1=30 patients for Phenobarbital group or group A while n2=30 patients for intravenous Levetiracetam group or group B.

Sampling technique: Non-probability Consecutive Sampling

After getting permission from the concerned authorities and ethical committee, total of 60 patients presenting to emergency department of neonatal unit with seizures were included after fulfilling the inclusion criteria. The Informed consent was taken from all the patients care takers. All neonates with clinically identifiable seizure were included in the study. The blood sample for secondary causes of seizures was sent to laboratory these include blood sugar, serum calcium, magnesium, sodium, potassium. Other disease specific investigation was sent. The antibiotic administration was based on departmental policy as 1st, 2nd & 3rd line antibiotics and other drugs like intravenous fluids, blood products were according to the need for the patients. For anticonvulsant therapy we divided patients randomly into two groups Group A and Group B via lottery method. Group A was given inj phenobarbitone loading dose maximum 40mg/kg (initial loading dose 20mg/kg reloading with 10 mg/kg for further 2 times) and maintenance dose 5mg/kg. Group B was given injection Levetiracetam loading maximum40mg/kg (initially with 30mg/kg then reloading with 10mg/kg) and maintenance dose 20mg/kg/day. Both Drugs were given in infusion form in dilution in 15 ml normal saline over 15 minutes. If seizures reoccur with maximum loading dose then the patient was switched to other drug. Patient was continuous monitoring & observed for reoccurrence of seizure within 24 hours. Efficacy as per operational definition was noted after 24 hours by the researcher himself. All data was recorded on the specially designed Proforma.

Data was analyzed with statistical analysis program (SPSS version 22).

Inclusion criteria:
1. Age < 28 days
2. Both gender
3. Neonatal seizures as per operational definition for < 24 hours

Exclusion criteria:
1. Who were already receiving anticonvulsants
2. If seizures were due to correctable metabolic abnormalities (i.e. hypoglycemia, hypocalcemia, hypomagnesaemia, hyponatremia)
3. Neonates with associated pulmonary, hepatic, renal, or cardiac dysfunction.

RESULTS

Age range in this study was < 28 days with mean age of 15.200± 5.62 days in Group A while 14.900± 5.99 days in Group B. Mean duration of complain was 10.400±4.83 hours in Group A and 11.433±4.67 hours in Group B.

Table No. 1: Mean±SD of patients according to age, gestational age and BMI in both groups (n=60)

<table>
<thead>
<tr>
<th>Demographics</th>
<th>Mean±SD</th>
<th>Case Group n=30</th>
<th>Mean±SD</th>
<th>Control Group n=30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age(days)</td>
<td>15.200±5.62</td>
<td>14.900±5.99</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duration of Complain (hours)</td>
<td>10.400±4.83</td>
<td>11.433±4.67</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight (Kg)</td>
<td>4.056±0.65</td>
<td>4.163±0.64</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Mean weight was 4.056±0.65 kg in Group A and 4.163±0.64 Kg in Group B as shown in Table-1. Male gender was dominant in both group (63.3% and 63.3%) as shown in Table-2.
Levetiracetam has been reported to be a promising new drug for neonatal seizures. In two separate case series, Shoemaker and Rotenberg reported 80% seizure control in 10 infants aged 1 day to 3 months, treated with oral levetiracetam for seizures refractory to phenobarbital, phenytoin and benzodiazepines.\(^5\)\(^6\)\(^7\) Furwentsches et al did prospective pilot feasibility study of oral levetiracetam for 3 days on newborns with seizures but they permitted additional treatment with single daily doses of phenobarbitone. So, which drug contributed more to this seizure control would be difficult to say. A recently published case series of 22 neonates by Khan O et al reported clinical control of seizures in 32%, in babies who had not responded to phenobarbitone.\(^6\) Similarly, Abend NS et al reported effective seizure control in 35% neonates.\(^1\) Most studies have used levetiracetam as second line drug after phenobarbitone failure. Our study is the first study to test levetiracetam as a first line drug in treatment of neonatal seizures in Pakistan.

In my study efficacy was seen in 9 (30%) patients with phenobarbitone as compare to 25 (83.3%) patients with Levetiracetam, (P=0.000). In a study by Daoud A has showed the efficacy of 50% with intravenous levetiracetam for the treatment of neonatal seizures.\(^8\) In another study, Perveen S, et al has showed the efficacy of 23.3% with intravenous levetiracetam as compared to 86.7% with Phenobarbitone for the treatment of neonatal seizures.\(^7\)

There was not enough data on pharmacokinetics of levetiracetam at time of onset of our trial. We used a loading dose of 60 mg /kg followed by maintenance dose of 30 mg/kg/day based on dose used in a study. Though subsequent study on pharmecokinetics of levetiracetam were done using 40 mg/kg, Ramantani G et al have reported safety and efficacy of LVR with 60 mg/kg as dose of 30 mg/kg/day based on dose used in a study. There was not enough data on pharmacokinetics of levetiracetam at time of onset of our trial. We used a loading dose of 60 mg /kg followed by maintenance dose of 30 mg/kg/day based on dose used in a study. Though subsequent study on pharmecokinetics of levetiracetam were done using 40 mg/kg, Ramantani G et al have reported safety and efficacy of LVR with 60 mg/kg as well.\(^1\) Higher dose may be required in neonates due to (i) higher volume of distribution (ii) greater than predicted clearance in first week of life (iii) intractability of neonatal seizures in neonates and (iv) safety demonstrated in children even with dose up to 275 mg/kg and up to 1800 mg/kg in animals (no death, organ failure or irreversible toxicities were noted). The eight hourly dosing is required to ensure that 95% of infants maintain trough concentration >10 microgram/ml and above 20 microgram/ml for 1st 3 days when seizure frequency is maximum. The 12 hourly dosing schedule used in our study was supported by a subsequent pharmocokinetic study by Merher SL et al who reported that 12 hourly interval is acceptable due to reduced renal clearance until the glomerular filtration matures over first few weeks.\(^13\)

### DISCUSSION

#### Table No.2: Frequency and %age of patients according to gender in both groups

<table>
<thead>
<tr>
<th>Gender</th>
<th>n=30 Group A</th>
<th>n=30 Group B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>19 (63.3%)</td>
<td>19 (63.3%)</td>
</tr>
<tr>
<td>Female</td>
<td>11 (36.7%)</td>
<td>11 (36.7%)</td>
</tr>
</tbody>
</table>

#### Table No.3: Comparison of Efficacy in both groups (n=60)

<table>
<thead>
<tr>
<th>Efficacy</th>
<th>Group A</th>
<th>Group B</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>9 (30%)</td>
<td>25 (83.3%)</td>
<td>0.000</td>
</tr>
<tr>
<td>No</td>
<td>21 (70%)</td>
<td>5 (16.7%)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>30 (100%)</td>
<td>30 (100%)</td>
<td></td>
</tr>
</tbody>
</table>

#### Table No.4: Stratification of Efficacy with respect to age in Group A and Group B

<table>
<thead>
<tr>
<th>Group</th>
<th>Efficacy</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>3 (17.6%)</td>
<td>14 (82.4%)</td>
</tr>
<tr>
<td>B</td>
<td>14 (82.4%)</td>
<td>3 (17.6%)</td>
</tr>
</tbody>
</table>

#### Table No.5: Stratification of Efficacy with respect to gender in Group A and Group B

<table>
<thead>
<tr>
<th>Group</th>
<th>Efficacy</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>5 (26.3%)</td>
<td>14 (73.7%)</td>
</tr>
<tr>
<td>B</td>
<td>16 (84.2%)</td>
<td>3 (15.8%)</td>
</tr>
</tbody>
</table>

#### Table No.6: Stratification of Efficacy with respect to duration of complain in Group A and Group B

<table>
<thead>
<tr>
<th>Group</th>
<th>Efficacy</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>7 (38.9%)</td>
<td>11 (61.1%)</td>
</tr>
<tr>
<td>B</td>
<td>16 (100%)</td>
<td>0 (0%)</td>
</tr>
</tbody>
</table>

#### Table No.7: Stratification of Efficacy with respect to weight in Group A and Group B

<table>
<thead>
<tr>
<th>Group</th>
<th>Efficacy</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>5 (62.5%)</td>
<td>3 (37.5%)</td>
</tr>
<tr>
<td>B</td>
<td>6 (85.7%)</td>
<td>1 (14.3%)</td>
</tr>
</tbody>
</table>

In group A efficacy was seen in 9 (30%) patients as compare to 25 (83.3%) patients in group B, (P=0.000) as shown in Table-3. Stratification of efficacy with regard to age, gender, duration of complain and weight are shown in Table-4, 5, 6 and 7 respectively.
Our study does not report any significant effect of levetiracetam on hemodynamic, cardiovascular or renal status. Merher SL et al also reported no change in vital sign or laboratory parameters with its use.\textsuperscript{13} Levetiracetam is reported to cause only minor side effects like sedation, behavior abnormalities and depression in older children and somnolence in neonates. Occasional reports of reversible thrombocytopenia and possible liver failure and anaphylactic shock because of levetiracetam have also been reported.\textsuperscript{14} Though levetiracetam has predominantly renal excretion, like us, other studies has also not reported derangements in renal parameters with its use. Boylan GB et al had reported that only about 35\% neonates with electrical seizures display clinical seizures.\textsuperscript{15} In other two-third babies, clinical manifestations were unrecognized even by experienced neonatal staff. They therefore concluded that clinical diagnosis may not be enough in recognition and management of neonatal seizures. However, more trials, with larger sample size are required. Further studies are required to evaluate role of LVR in neonatal seizure both as first line and 2nd line therapy. Role of higher first dose and repeated loading doses in non-responders to 1st dose also needs to be evaluated in further studies. More studies on pharmacokinetics with larger sample size are also required.

CONCLUSION

It is concluded that levetiracetam is more efficacious than phenobarbitone in control of clinical seizures in treatment of neonatal seizures. Phenobarbitone is often ineffective as a first line anticonvulsant in neonates with seizures in whom the background EEG is significantly abnormal. Levetiracetam has been tried for the treatment of seizures refractory to phenobarbitone in children and neonates.

Author’s Contribution:

Concept & Design of Study: Junaid Ghaffar
Drafting: Amna Riaz, Uzair
Data Analysis: Ahmad Omair Virk, Akmal Bhatti
Revisiting Critically: Junaid Ghaffar, Amna Riaz
Final Approval of version: Junaid Ghaffar

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

Role of Neutrophil / Lymphocyte Ratio in Diabetes 2 Nephropathy
M Husain Bloch¹, Faisal Iqbal², Nadeem Shafiq³ and Akmal Bhatti⁴

ABSTRACT

Objective: To study the role of Neutrophil / lymphocyte ratio in diabetes 2 nephropathy

Study Design: Observational / cross sectional Study

Place and Duration of Study: This study was conducted at the Rawal Institute of Medical Sciences Rawalpindi and Idris Teaching Hospital Sialkot during Feb 2018 to Feb 2020.

Materials and Methods: It is an observational cross-sectional study. Totally 115 diagnosed type 2 diabetes mellitus patients were registered in this study. NLR was calculated by analyzing differential leukocyte count in complete blood picture. Albuminuria was tested by MICRAL-II TEST strips by dipstick method. Demographic data and laboratory Investigations were recorded on designed Performa. Informed written consent was taken from every patient before collecting the sample, history and examination. Permission of Ethical Committee of the Institute was considered for collection of data and get publishing in medical journal.

Results: Totally 115 diabetic patients were registered. About 56 patients had DN and 59 had normal urine albumin. Mean NLR for a normal group is $1.94 \pm 0.65$ and in DN group is $2.83 \pm 0.85$ which was highly significant ($P < 0.001$). Estimated glomerular filtration rate ($P = 0.047$) and serum glutamate pyruvate transaminase ($P < 0.001$) were also significant.

Conclusion: The results of our study show that there was a significant relation between NLR and DN. Therefore, NLR may be considered as a novel surrogate marker of DN in early stages.

Key Words: Diabetic nephropathy, inflammation, microvascular, neutrophil-lymphocyte ratio, urine albumin


INTRODUCTION

Diabetes mellitus is a fundamental infection having genuine microvascular and macrovascular entanglements. Microvascular intricacies incorporate diabetic nephropathy (DN), diabetic retinopathy, and diabetic neuropathy while macrovascular confusions incorporate stroke, cardiovascular ailments (CVDs), and fringe vascular diseases.¹

DN is a typical miniaturized scale angiopathic inconvenience in patients with diabetes. DN is one of the most well-known reasons for end-stage renal illness (ESRD).² DN is clinically showed as expanded egg whites urea discharge beginning from microalbuminuria to macroalbuminuria and in the long run ESRD.³ However, the level of albuminuria isn't really connected to infection movement in patients with DN related with either type 1 or type 2 diabetes mellitus (T2DM).⁴,⁵ In type 1 diabetes, when clear DN creates, there is persevering proteinuria, and movement toward ESRD must be eased back yet couldn't be stopped.⁶,⁷ Due to this, there is a need of early indicators of DN by which we can foresee the sickness and can end the movement of the ailment. The Asian Indian populace has more commonness of DN when contrasted with the Caucasian population.⁸

A few investigations that have investigated the connection between fundamental irritation and vascular infection showed that constant aggravation advances the turn of events and quickening of small scale and full scale angiopathic intricacies in patients with diabetes. All out white platelet (TWBC) tally is a rough however delicate pointer of aggravation which should be possible effectively in research center routinely. It is a financially savvy examination. Increment in the neutrophil include is found in blood clot development and ischemic ailments. The neutrophil-lymphocyte proportion (NLR) in complete blood include is concentrated in numerous cardiovascular and noncardiac infections as a fiery marker and is utilized to anticipate the forecast of sicknesses, for example, intense myocardial dead tissue (MI), stroke, and cardiovascular breakdown.

DN in T2DM has a provocative pathology. Numerous incendiary markers have been seen as identified with DN, for example, interleukin-1 (IL1), IL6, IL8, changing development factor beta 1, tumor rot factor-

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alpha (TNF-α), and cytokines. Notwithstanding, their estimation isn't utilized routinely as it is difficult to do it.9,10 In this regard, NLR has developed as a novel substitute marker. In the current investigation, the relationship of NLR with DN in Indian patients is examined, regardless of whether NLR can be utilized as a substitute marker of DN in this populace.

MATERIALS AND METHODS

It is an observational cross-sectional study. This study was conducted at the Rawal Institute of Medical Sciences Rawalpindi and Idris Teaching Hospital Sialkot during Feb 2018 to Feb 2020. Totally 115 diagnosed type 2 diabetes mellitus patients were registered in this study. NLR was calculated by analyzing differential leukocyte count in complete blood picture. Albuminuria was tested by MICRAL-II TEST strips by dipstick method.

RESULTS

In this study, diagnosed T2DM patients were screened for DN. A total of 115 diabetic patients were registered. Of these, 56 patients had DN and 59 had normal urine albumin. All these patients were similar in their age distribution, dietary habits, smoking, and other profiles. These groups were compared for various variables such as age, BMI, WHR, BP, total leukocyte count, absolute Neutrophil count (ANC), absolute lymphocyte count (ALC), NLR, serum creatinine, blood urea, serum glutamate pyruvate transaminase (SGPT), serum glutamic oxaloacetic transaminase (SGOT), FBS, PPBS level, and HbA1c.

In the present study, the mean age of patients of normal group and DN group was 52.29 ± 11.45 years and 50.05 ± 11.29 years, respectively. Both groups had similar distribution of age (P = 0.294). In addition, there was no sex-related variability (in normal group, male = 26, female = 33, and in DN group, male = 25, female = 31) (P = 0.951). Metabolic and laboratory parameters such as and glycemic parameters (blood sugar level [BSL] fraction unbound in the plasma FBS, BSL PPBS, HbA1c) were compared in both groups and are shown in Table 1. There was a significant difference between the normal group and DN group with relation to NLR (P < 0.001), but individually, the TWBC count did not differ in the two groups [Table 2]. There was also a significant difference between normal group and DN group with relation to ANC (P < 0.001) and ALC (P < 0.001) [Table 2]. In the present study, renal function tests of all patients were carried out, and estimated GFR (eGFR) was calculated by CKD-EPI formulae. In relation to eGFR, there was a significant difference between the two groups (P = 0.047) [Table 3]. Patients with albuminuria had a significantly low eGFR (mean eGFR = 85.71 ± 27.72) than the normal group (mean eGFR = 96.2 ± 28.23). However, other investigations such as blood urea and serum creatinine had no difference in these two groups [Table 3]. LFTs for all patients were carried out, and SGPT (mean SGPT = 40.89 ± 36.62) was found to be significantly raised in DN patients' group as compared to normal patients' group (mean SGPT = 9.74 ± 13.03), which was highly statistically significant (P < 0.001) [Table 4]. In reference to glycemic parameters, we did not observe any significant difference with respect to FBS (P = 0.0769), PPBS (P = 0.5674), and HbA1c (P = 0.06) in the two groups, i.e., normal diabetic patients and patients with DN. In our study, by applying linear regression analysis, we found HbA1c as a risk factor for DN.

Table No 1. Comparison of demographic and laboratory parameters of diabetic patients

<table>
<thead>
<tr>
<th>Variable</th>
<th>Patients with albuminuria (n=61)</th>
<th>Patients without albuminuria (n=71)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>53.00 ± 11.23</td>
<td>51.05 ± 11.21</td>
<td>0.2842</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>31</td>
<td>33</td>
<td>0.851</td>
</tr>
<tr>
<td>Male</td>
<td>30</td>
<td>38</td>
<td></td>
</tr>
<tr>
<td>Hb (g %)</td>
<td>12.00 ± 1.23</td>
<td>12.23 ± 1.65</td>
<td>0.0975</td>
</tr>
<tr>
<td>FBS</td>
<td>172.45 ± 40.99</td>
<td>159.14 ± 40.99</td>
<td>0.089</td>
</tr>
<tr>
<td>PPBS</td>
<td>199.13 ± 46.23</td>
<td>196.17 ± 41.99</td>
<td>0.3421</td>
</tr>
<tr>
<td>BSL FUP FBS</td>
<td>147.17 ± 22.9</td>
<td>139.4 ± 21.93</td>
<td>0.0689</td>
</tr>
<tr>
<td>Hba1c</td>
<td>8.47 ± 1.49</td>
<td>7.78 ± 1.15</td>
<td>0.0599</td>
</tr>
</tbody>
</table>


Table No2. Neutrophil-lymphocyte ratio and other laboratory parameters of diabetic patients

<table>
<thead>
<tr>
<th>Variable</th>
<th>With nephropathy</th>
<th>Without nephropathy</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>NLR</td>
<td>2.82 ± 0.83</td>
<td>1.93 ± 0.63</td>
<td>0.00001</td>
</tr>
<tr>
<td>TLC</td>
<td>7579.35 ± 1882.43</td>
<td>7383.73 ± 1444.99</td>
<td>0.5320</td>
</tr>
<tr>
<td>ANC</td>
<td>5292.90 ± 1478</td>
<td>4652.52 ± 1184.93</td>
<td>0.0115</td>
</tr>
<tr>
<td>ALC</td>
<td>1946.99 ± 579.79</td>
<td>2448.99 ± 579.79</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

NLR: Neutrophil-lymphocyte ratio, TLC: Total leukocyte count, ANC: Absolute Neutrophil count, ALC: Absolute lymphocyte count Statistically significant (p<0.05).
### Table No.3: Renal function test of diabetic patients

<table>
<thead>
<tr>
<th>Variable</th>
<th>With nephropathy</th>
<th>Without nephropathy</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serum Urea</td>
<td>29.43 ± 14.73</td>
<td>25.37 ± 11.82</td>
<td>0.1051</td>
</tr>
<tr>
<td>Serum Creatinine</td>
<td>0.87 ± 0.32</td>
<td>0.78 ± 0.25</td>
<td>0.0791</td>
</tr>
<tr>
<td>GFR</td>
<td>85.70 ± 27.70</td>
<td>95.99 ± 27.79</td>
<td>0.046</td>
</tr>
</tbody>
</table>

Statistically significant (p<0.05). GFR: Glomerular filtration rate

### Table No.4: Liver function test of diabetic patients

<table>
<thead>
<tr>
<th>Variable</th>
<th>With nephropathy</th>
<th>Without nephropathy</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bilirubin</td>
<td>4.91 ± 1.780</td>
<td>0.62 ± 0.19</td>
<td>0.0672</td>
</tr>
<tr>
<td>SGPT</td>
<td>40.87 ± 17.06</td>
<td>28.99 ± 13.00</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>SGOT</td>
<td>41.19 ± 36.59</td>
<td>32.11 ± 12.90</td>
<td>0.825</td>
</tr>
</tbody>
</table>

Statistically significant (p<0.05). SGPT: Serum glutamate pyruvate transaminase. SGOT: Serum glutamate oxaloacetic transaminase

### DISCUSSION

The key finding of this examination was that NLR levels were seen as essentially related (P = 0.001) with patients who were determined to have beginning time DN when contrasted with those with typical egg whites levels. This investigation is one of the first in Quite a while to survey the connection between NLR and complications.10

NLR is a novel marker of interminable irritation that displays a parity of two reliant segments of the insusceptible framework; neutrophils that are the dynamic vague incendiary go between structures the principal line of resistance though lymphocytes are the administrative or defensive part of inflammation.11

In CKD patients, NLR has demonstrated to be a simple and reasonable lab boundary that gives huge data with respect to irritation. Besides, in a 3-year follow-up investigation of diabetic patients, NLR filled in as an indicator of intensifying renal function. Afsar has demonstrated that NLR could be identified with DN and is likewise associated as a pointer of ESRD.12 In another examination, Akbas et al. have indicated that NLR was essentially raised in patients with expanded albuminuria highlighting a connection among irritation and endothelial brokenness in diabetics with nephropathy.13

So also in our examination, the mean NLR among diabetic patients with albuminuria (2.83 ± 0.85) was altogether higher than among those without albuminuria (1.94 ± 0.65). Furthermore, ANC and ALC levels were additionally seen as essentially corresponded with patients with albuminuria. In concordance with our outcomes, Huang et al. have additionally discovered that NLR esteems were fundamentally higher in diabetic patients with proof of nephropathy (2.48 ± 0.59) than in diabetic patients without nephropathy (2.20 ± 0.62) and solid controls (1.80 ± 0.64). ANC and ALC levels were additionally found to correspond with DN in their examination.14 In addition, an ongoing report in Egyptian patients has demonstrated by Moursy et al that NLR esteems were fundamentally higher in diabetic patients with retinopathy (P < 0.001), neuropathy (P = 0.025), and nephropathy (P < 0.001) than those of diabetic patients with no microvascular inconveniences and solid controls.15 Another as of late distributed investigation in Turkish patients has likewise demonstrated by Kahraman C, et al that NLR levels altogether expanded in corresponding to albuminuria levels in diabetic patients.16

There was no critical connection among's typical and DN bunches corresponding to age, sex, BMI, WHR, Hb, absolute cholesterol, LDL, TG, HDL, and VLDL as saw in the current investigation despite the fact that there was noteworthy contrast among the two gatherings in regard to eGFR values (P = 0.047). Patients with albuminuria had altogether low eGFR (mean eGFR = 85.71 ± 27.72) when contrasted with those patients with typical egg whites levels (mean eGFR = 96.2 ± 28.23). eGFR is one of the most explicit boundaries for kidney function.17 if there should be an occurrence of DN, eGFR diminishes as sickness advances. There were no critical intergroup contrasts for either blood urea or serum creatinine levels.

Concerning glycemic boundaries, there were no noteworthy contrasts between the two gatherings, comparable to FBS, PPBS, or HbA1c however different examinations have demonstrated HbA1c to be a free hazard factor for DN.18 On applying straight relapse investigation in the current examination, HbA1c was additionally seen as an indicator for DN.

One of the constraints of this examination is this was a sectional investigation and the example size was inconveniences and solid controls.

### CONCLUSION

The results of our study show that there was a significant relation between NLR and DN. Therefore, NLR may be considered as a novel surrogate marker of DN in early stages.

**Author’s Contribution:**
- Concept & Design of Study: M Husain Bloch
- Drafting: Faisal Iqbal
- Data Analysis: Nadeem Shafiq, Akmal Bhatti
- Revisiting Critically: M Husain Bloch
the relationship between neutrophil
lymphocyte ratio and microvascular
complications in geriatric diabetic patients? J

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Frequency of Coronary Artery Anomalies in Adult Patients Undergoing Coronary Angiography for Ischemic Heart Disease

Noor ul Hadi¹, Tariq Nawaz², Asfandiyar¹, Syed Tahir Shah³, Farooq Ahmad⁴ and Mushtaq Ahmad¹

ABSTRACT

Objective: To find frequency of congenital coronary artery anomalies in patients, undergoing coronary angiography.

Study Design: Observational Cross Sectional study.

Place and duration: This study was conducted at the Cardiac Catheterization Laboratory of Lady Reading Hospital Peshawar from March 2009 to March 2020.

Materials and Methods: In this study, a total of 21,362 coronary Angiographies were performed for work up of Coronary artery disease.

Results: Coronary Artery Anomalies were found in 1.9% (n=405) patients. Mean age was 48.5±12.5 years. Males were 69.2% (n=280) and female were 30.7% (n=124). The most common anomaly was anomalous origin of Right Coronary Artery from posterior sinus of Valsalva. It was found in 38.5% (n=156) patients. The diagnostic catheter used was Judkin Right 4, while in 15 patients, it was engaged with Amplatz Right catheter, AR 1. Second most common anomaly was separate origin of Left Anterior Descending artery and Left Circumflex artery. It was found in 30.7% (n=124) patients. All were engaged with Judkin Left, JL 4 Catheters. The third most common anomaly was abnormal origin of Left Circumflex from right sinus of Valsalva in 15.3% (n=62). All were engaged with Judkin Right 4 catheters except in 15 cases, which required 3DRC. Anomalous origin of Right Coronary Artery from left sinus of Valsalva was found in 11.5% (n=46) patients. All were engaged with JL 4 catheters. Only 1% (n=4) patients had LAD-RV fistula. All were engaged with Judkin Left 3.5 catheter.

Conclusion: Coronary artery anomalies were rare findings in adults. Most common anomaly was the anomalous origin of Right Coronary Artery from posterior sinus.

Key Words: coronary artery anomalies, coronary artery disease, catheters


INTRODUCTION

Coronary artery anomalies, CAD, defined as those angiographic findings in which the number, origin, and termination of the arteries are rarely encountered in the general population.

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observed. Coronary artery anomalies were discovered in less than 1% of angiography series. Since the number of angiographies and coronary bypass operations are increasing significantly every day, these anomalies are of clinical importance. However, data about left anterior descending artery anomalies in literature is still scarce.4-6

Few studies have been conducted on congenital coronary artery anomalies in our set up. The rationale of the study is to find the frequency of congenital coronary artery anomalies. This study may enable us to plan proper management strategy for patients with congenital coronary artery anomalies. It can also help us in selecting proper catheters for cannulation of these anomalous arteries.

MATERIALS AND METHODS

This observational, cross-sectional study was conducted at Department of Cardiology, Postgraduate Medical Institute, Lady Reading Hospital, Peshawar Pakistan; from March 2009 to March 2020. This is a tertiary care hospital which receives patients from across the City and the province. Non probability sampling was done and sample size was calculated to be 1362 using WHO sample size calculator.

Patients were included from both genders, undergoing coronary angiography for work up of coronary artery disease in Post Graduate Medical Institute, Govt. Lady Reading Hospital Peshawar. All those patients were excluded from study who had undergone percutaneous coronary intervention previously, undergone CABG (Coronary artery bypass grafts.), and those having congenital valvular heart diseases and congenital heart disease.

Patients admitted to Cardiology Unit Lady Reading Hospital Peshawar, via Out Patient Department or Casualty and undergoing Coronary angiography for Work up of CAD were enrolled in the study. The diagnostic Criteria for CAD was defined in terms of stable angina, unstable angina, Q-wave MI and non Q-wave MI. Approval of ethical committee was taken from Lady Reading Hospital. The patients were requested to give written informed consent. Coronary angiography was then performed in these patients through femoral artery or radial artery. The angiography report was analyzed and those with anomalous coronary arteries were selected for further assessment. The films were reviewed by two cardiologists independently before being finally classified. In case of difference of opinions, a consensus was reached. The data thus collected were documented on a pre designed questionnaire. The types of catheters used for cannulation of these anomalous arteries were also documented in the questionnaire.

Data obtained after coronary angiograms were documented on the proforma. SPSS version 20 was used for data analysis. Ratio for sex distribution and Mean ± SD for age distribution was computed. For categorical variables like Anomalous origin, single coronary artery, intercoronary communication, and coronary artery fistulae, frequencies and percentages were computed. The results were presented as Tables and Graphs wherever required.

RESULTS

Out of 21,362 patients, 29.4% (n=400) were females as compared to 70.6% (n=962) males. It is shown in Fig 1. The mean age of the sample was 53.86 years with a SD of 10.65 years. Coronary Artery Anomalies were found in 1.9% (n=405) patients as shown in figure 2.

Out of these 405 patients, mean age was 48.5±12.5 years. Males were 69.2% (n=280) and females were 30.7% (n=124).

The most common anomaly was the anomalous origin of Right Coronary Artery from posterior sinus of Valsalva. It was found in 38.4% (n=156) patients. The diagnostic catheter used was Judkin Right 4. Only in 15 patients, it was engaged with AR 1.

Second most common anomaly was separate origin of Left anterior descending artery and Left circumflex artery. It was found in 30.7% (n=124) patients. All were engaged with JL 4 Catheters. The third most common anomaly was anomalous origin of Left Circumflex from right sinus of Valsalva in 15.3% (n=62) patients.

Graph No.1: Gender distribution of coronary artery anomalies

Graph No.2: Frequency of Coronary artery anomalies

All were engaged with Judkin Right 4 catheter except 14 cases, with 3DRC. Anomalous origin of Right Coronary Artery from left sinus of Valsalva was found
in 11.5% (n=46) patients. All were engaged with JL 4 catheters. Only 4 patients (1%) had LAD-RV fistula. It was engaged with Judkin Left 3.5 catheter. The results are shown in the Figure 3 and table 1.

**Coronary Artery Anomalies**

Graph No.3: Distribution of coronary artery anomalies

Table No.1: Different types of catheters used for engagement of anomalous arteries

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Anomalies</th>
<th>%ages</th>
<th>Catheters</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Anomalous origin of Right Coronary Artery from PSV.</td>
<td>38.4%</td>
<td>All were engaged with JR 4, 15 cases engaged with AR 1.</td>
</tr>
<tr>
<td>2</td>
<td>Separate origin of left anterior descending and Left circumflex artery.</td>
<td>30.7%</td>
<td>JL 4.</td>
</tr>
<tr>
<td>3</td>
<td>Left circumflex from RSV.</td>
<td>15.3%</td>
<td>All were engaged with JR 4 except 15 with 3DRC.</td>
</tr>
<tr>
<td>4</td>
<td>Anomalous RCA from LSV</td>
<td>11.5%</td>
<td>JL 4.</td>
</tr>
<tr>
<td>5</td>
<td>LAD from RC fistula.</td>
<td>3.8%</td>
<td>JL 3.5</td>
</tr>
</tbody>
</table>

AO-Anomalous Origin:
- SO-Separate Origin
- RCA-Right Coronary Artery
- LAD-Left Anterior Descending Artery
- RSV-Right Sinus of Valsalva
- LCxA-Left Circumflex Artery

**DISCUSSION**

Coronary artery anomalies are rare and found in less than 1% population. It is important in a sense that they are an important source of ischemia and sudden cardiac death. According to our knowledge this is the largest study dealing with the frequency of congenital coronary artery anomalies in Northern Pakistan. We studied 21,362 coronary angiographies from March 2009 to March 2020 in a cross sectional way for work up of Coronary Artery Disease. Anomalies were found in 405 patients (1.9%). The mean age of the patients having anomalies was 48.5 ±12.5 years. Males were 69.2% (n=280) and females were 30.7% (n=124). This is consistent with international studies. Normal coronary anatomy has not been well described in studies on the embryological development of heart and the pathophysiology of coronary anomalies is not well understood. There are no major works based on unselected large populations defining normal anatomy or variations in the normal arrangements of coronary arteries.

A description of the normal is necessary in order to define the abnormal. The work of Angellini, published in 1989, brought to bear a definitive concept in this area. As stated in this work, the primary assumption is that the term normal must apply to 99% of the population, which automatically implies that the prevalence of the coronary artery anomalies must be below 1%. Similar ratios have been reported in several large reports. In these studies, the incidence of coronary artery anomalies is given as 0.2-1.34%. The incidence of coronary anomalies in our study is 1.9%. In this way, this figure is quite consistent with these studies.

The vast majority of the patients who visited our catheterization lab are adults. Probably for this reason, coronary artery anomalies co-existing with major cardiac congenital anomalies were not found in our study. Also, clinically more dramatic pictures, with lethal natural histories in early infancy, such as Bland White Garland syndrome, are not present. Anomalous left coronary artery originating from the pulmonary artery (ALCAPA) is a rare congenital anomaly, present in 1 out of 300,000 live births. This anomaly may cause myocardial ischemia or infarction, mitral insufficiency, congestive heart failure, and death in early infancy, if not treated. Since 90% of these die in infancy of myocardial infarction, congestive heart failure, or sudden death, it is not surprising that in our grown-up population we did not find a patient with Bland-White-Garland syndrome.

Coronary arteriovenous fistulae (CAVF), represent an anomalous termination. CAVF, first described by Krause in 1865, are present in 1 of 50,000 live births i.e 0.002% of the general population. It is present in 4 out of 1362 cases (1%) our study. This may be congenital or acquired (traumatic, infections or iatrogenic). An angiographic classification scheme has been proposed by Sakakribara et al. Coronary artery fistula is treated as left to right shunts. The magnitude of the shunt can be determined by hemodynamic studies; if there are no ischemic symptoms due to coronary steal, surgical indications depend primarily on the magnitude of the shunt. Coronary left sided cameral fistula must be evaluated as aortic sufficiency. These may also cause ischemic symptoms, and the treatment modality for these anomalies should depend on the symptoms and left ventricular junction.

Anomalies of the aortic origins of the coronary arteries represent one third of all coronary anomalies. This figure is same in our series. In our series, there were 15.3% of left circumflex arising from RSV. While there were 11.5% of RCA from LSV. LMCA from RSV...
represents the most serious coronary anomaly of the origin, associated with the highest incidence of symptoms and sudden death. Fortunately, there were no such cases in our series of patients. The reason could be that since it is a rarity. Thus further large studies are needed to find it. Most common anomalies in our patients were anomalous origins of RCA from posterior sinus of valsalva. It was found in 156 patients (38.4%). Second most common anomaly was separate origins of Left anterior descending artery and Circumflex artery. They usually pose no serious threats. The problem is engagement of these vessels during coronary angiography. Their frequency is the same as in international studies.

**CONCLUSION**

Coronary artery anomalies are rare findings in adults. Most are discovered incidentally in adult population. The most common anomaly was the anomalous origin of Right Coronary Artery from posterior sinus of Valsalva. They are usually engaged with Judkin Catheters.

**Author’s Contribution:**
- Noor ul Hadi
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- Syed Tahir Shah, Farooq Ahmad, Mushtaq Ahmad
- Noor ul Hadi, Tariq Nawaz

**Conflict of Interest:** The study has no conflict of interest to declare by any author.

**REFERENCES**

Frequency of Hypoalbuminemia in Critically ill Patients Admitted to Intensive Care Unit


ABSTRACT

Objective: Problem of hypoalbuminemia is a commonly found among those patients who are having chronic and acute medical conditions. Level of serum albumin is counted as an essential prognostic indicator. The aim of our study was to determine the frequency of hypoalbuminemia in the admitted patients who are critically ill and whose admission was in tertiary care hospital’s intensive care unit (ICU).

Study Design: Cross sectional study

Place and Duration of Study: This study was conducted at the Department of General Medicine, Liaquat National Hospital & Medical College, Karachi from July 2018 to Dec 2018.

Materials and Methods: 178 patients fulfilling inclusion criteria were enrolled in this study. Patients were admitted to ICU. After shifting, blood sample was obtained through staff nurse by using 5cc BD syringe. All samples were sent to the laboratory of the hospital for assessment of albumin level to reach the outcome i.e. hypoalbuminemia. All this information was recorded a proforma.

Results: Mean age of the patients was 50.66 (SD=7.97) years. There were 93(52.25%) male and 85(47.75%) female. Hypoalbuminemia’s frequency in those patients who are critically ill and whose admission was in intensive care unit (ICU) came out to be in 26.79% (48/178) patients.

Conclusion: In conclusion, albumin has major role in severity of disease. Serum albumin measurement during the period of admission to the intensive care unit (ICU) could be utilized as a biomarker in order to facilitate the recognition of group of patients at high risk.

Key Words: Hypoalbuminemia, critically ill patients, serum albumin

INTRODUCTION

Serum albumin in human is known as the most plentiful protein in his/her blood plasma. Around half of the serum protein is constituted by Albumin. It is monomeric and soluble as well. The range for the concentrations of albumin in serum is about 35 - 50 gram/liter (3.5 - 5.0 gram/dL). Various conditions can be the cause of hypoalbuminemia, i.e. hepatic cirrhosis, nephrotic syndrome, malnutrition and heart failure; although in most of the cases, acute and chronic inflammatory responses are found to be the cause of hypoalbuminemia. Level of serum albumin is counted as an essential prognostic indicator. Lower levels of serum albumin are associated with the greater risk of mortality and morbidity among the patients who are hospitalized.

One study conducted in a regional teaching hospital in Denmark in acutely medical patients admitted to medical unit, the frequency of hypoalbuminemia was reported to be 12.5%. While India reported slightly high frequency of hypoalbuminemia i.e. 21% in the patients who were critically ill and were in ICU. One more study also reported that 82 percent of the patients had the concentration of serum albumin <35 g/L.

Rationale of this study is to reveal the frequency of Hypoalbuminemia in those patients who are critically ill and were in intensive care unit of a tertiary care hospital. Literature has reported ambiguous results. As some reported the frequency of hypoalbuminemia was low while other reported it to be high. But we did not find any local evidence which showed the actual extent in local population. Albumin has major role in severity
of disease. So we planned to conduct this study in local population presenting in a tertiary care hospital. This will help us to get local data which will help us to plan the management of such critically ill patients.

MATERIALS AND METHODS

Inclusion Criteria: Patients of age 30-70 years of either gender, critically ill (as per operational definition) admitted in ICU

Exclusion Criteria:
- Patients with immune deficiency, malabsorption syndrome, celiac disease, protein losing enteropathy (on medical record and clinical assessment)
- Smoker (>2packs/year) for more than 5 years.
- Decompensate liver disease (ALT>40IU, AST>40 IU)
- Nephrotic syndrome (already diagnosed case)

178 patients fulfilling inclusion criteria were enrolled in the study from the emergency of Department of Medicine, Liaquat National Hospital, Karachi. Informed consent was obtained and demographics of patients (name, age, gender, diagnosis and contact) were noted. Patients were admitted to ICU. After shifting, blood sample was obtained through staff nurse using 5cc BD syringe. All samples were sent to the laboratory of the hospital for assessment of albumin level. Reports was assessed to hypoalbuminemia was noted (as per operational definition). All this information was recorded on proforma.

Statistical analysis: Collected data was entered and analyzed using SPSS 22. Quantitative data like age was described by Mean ± S.D, while qualitative data like gender and hypoalbuminemia was described using frequency and percentage. Data was stratified for gender, age, Diagnosis (cause of admission). Chi-square was applied to compare stratified groups taking p-value≤ 0.05 as significant.

RESULTS

There were 178 patients with critical illness admitted in ICU were recruited in this study. It was observed that most of the cases were between 46 to 60 years of age. Mean age and serum albumin of the patients was 50.66 (SD=7.97) years and 37.85(SD=6.02) as shown in table 1. Gender distribution of the study in Table-2 showed that 93(52.25%) were male and 85(47.75%) female. Regarding diagnosis alcohol intoxication, meningoencephalitis, wound sepsis and malaria were the commonest, as shown in figure-1. Frequency of hypoalbuminemia in critically ill patients admitted to intensive care unit was observed in 26.79% (48/178 patients), as shown in figure-2. Rate of hypoalbuminemia was observed among different age groups but there were no significant difference in the rate of hypoalbuminemia as shown in table-3. It was also observed rate of hypoalbuminemia was also not significant between male and female (21.5% cs. 32.9%; p=0.086) as shown in table-4. Frequency of hypoalbuminemia in critically ill patients admitted to intensive care unit with respect to diagnosis was shown in figure-3 which was also insignificant association with hypoalbuminemia.

Table No.1: Descriptive statistics of study patients n=178

<table>
<thead>
<tr>
<th>Statistics</th>
<th>Age (Years)</th>
<th>Serum Albumin (gl)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>50.66</td>
<td>37.85</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>7.97</td>
<td>6.02</td>
</tr>
<tr>
<td>95% Confidence Interval for Mean</td>
<td>49.48</td>
<td>36.96</td>
</tr>
<tr>
<td>Lower Bound</td>
<td>51.84</td>
<td>38.75</td>
</tr>
<tr>
<td>Upper Bound</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Median</td>
<td>51</td>
<td>38</td>
</tr>
<tr>
<td>Interquartile Range</td>
<td>10</td>
<td>9</td>
</tr>
</tbody>
</table>
Hypoalbuminemia is a regular and early biochemical unhealing in patients who are critically ill. While this critical illness, capillary permeability is increased intensely and adjusts the exchange of albumin in between the compartments i.e. intravascular and extravascular. In this setting hypoalbuminemia in those patients who are adults is an indicator of severity of disease and has been related with dependence of elongated ventilator and duration of stay at ICU. It is additionally an autonomous indicator of mortality and it is related with poor result in patients with critical illness. In basically sick and with extreme sepsis the metabolic response alters to make extraordinary measures of intense stage proteins. Since albumin isn’t an intense stage protein, change of manufactured ability to different proteins is probably going to diminish synthesis of albumin. Other likely reason recommended in the causality of hypoalbuminemia in these type of patients is improved vascular penetrability, which would energize a bigger move of albumin to the interstitial space from the vascular. 178 patients were there who were having critical illness and were admitted in intensive care unit; those patients were selected for this study.

In this research, 52.25% (93) of the patients were counted to be males and rest of 47.75% (85) were females. This male prevalence is also upheld by the literature. Robert AN et al detailed that from the total number of 466 patients, 792 were admitted in the hospital. Proportion of admission for males and females came out to be 60% v. 39.9%. Levels of serum albumin were abnormally low (<35 g/L) and are found to be continuous and timely biochemical disturbance in adults who are critically ill with the indicated frequency of 30% to 40%. Reinhardt et al indicated that the concentration of serum albumin under 34 g/L was related with a month/30 days mortality of 24.6 percent. In this research occurrence of hypoalbuminemia in patients who are critically ill and are admitted to intensive care unit (ICU) was found in 26.79 percent patients. McCluskey et al reported in their research that out of 348 back to back patients who were critically ill and were admitted to ICU, 29.3 percent of them were having lower concentrations of serum albumin ad the time of admission. Ryan et al revealed that 31 percent of patients who were admitted to ICU after the completion of upper gastrointestinal medical procedure for harm had level of serum albumin less than 20 gram/Ltr. On the primary postoperative day was an autonomous indicator of complications. Amendys-Silva et al in their research detailed that, from 200 admissions of patients in ICU, who were critically ill, 82 percent of them were having the level of serum albumin less than 35 gram/Liter.

The hypoalbuminemia is related with expanded inconveniences and more regrettable forecast in numerous populations. The part of the hypoal-

### Table No.2: Frequency distribution of gender (n=178)

<table>
<thead>
<tr>
<th>Gender</th>
<th>Frequency n=(140)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>93</td>
<td>52.25%</td>
</tr>
<tr>
<td>Female</td>
<td>85</td>
<td>47.75%</td>
</tr>
<tr>
<td>Total</td>
<td>178</td>
<td>100%</td>
</tr>
</tbody>
</table>

### Table No.3: Frequency of hypoalbuminemia in critically ill patients admitted to intensive care unit with respect to age groups n=178

<table>
<thead>
<tr>
<th>Age Groups (Years)</th>
<th>Hypoalbuminemia</th>
<th>Total</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Yes n=48</td>
<td></td>
</tr>
<tr>
<td>30 to 45 Years</td>
<td>8(21.6%)</td>
<td>37</td>
</tr>
<tr>
<td>46 to 60 Years</td>
<td>30(31.6%)</td>
<td>95</td>
</tr>
<tr>
<td>&gt; 60 Years</td>
<td>10(21.7%)</td>
<td>46</td>
</tr>
<tr>
<td></td>
<td>29(78.3%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chi-Square=2.201; p=0.333</td>
<td></td>
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</tbody>
</table>

### Table No.4: Frequency of hypoalbuminemia in critically ill patients admitted to intensive care unit with respect to gender n=178

<table>
<thead>
<tr>
<th>Gender</th>
<th>Hypoalbuminemia</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes n=48</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>20(21.5%)</td>
<td>93</td>
</tr>
<tr>
<td>Female</td>
<td>28(32.9%)</td>
<td>85</td>
</tr>
<tr>
<td></td>
<td>73(78.5%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chi-Square= 2.95 p=0.086</td>
<td></td>
</tr>
</tbody>
</table>

**DISCUSSION**

Albumin is known as an essential molecule in the pathophysiological and physiological conditions, with various impacts, i.e. osmotic pressure regulation; bearer of ineffectively water dissolvable particles, for example, cholesterol, hormones, iron, calcium, bilirubin, medications and free fatty acids; and against oxidant properties and mitigating effects.
Hypoalbuminemia as an indicator of result in the ICU is reflected in its joining as a segment of the APACHE III score. Murray et al. revealed that level of serum albumin was related with lengthy stay at the ICU and so the hospital in the patients who were ill. A meta-analysis of 16 RCTs also suggested that albumin use was associated with a significant reduction in mortality (odds ratio, 0.46; 95% CI, 0.25 to 0.86) and renal impairment (odds ratio, 0.34; 95% CI, 0.15 to 0.75) in patients with cirrhosis and any infection. Efforts to substitute synthetic colloids for albumin as part of perioperative fluid therapy have not been very successful. Hydroxyethyl starch solutions can persist for long durations in the skin, the liver and, most importantly, the kidney. Furthermore, in the population of adult trauma, serum albumin level was found to be lower i.e. less than 2.6 g/dL and they were also found to have essentially longer stay at ICU and the hospital. Delayed ventilatory care and more prominent mortality when coordinated for the severity of injury and age. Most recently, a cost-effectiveness analysis in severe sepsis and septic shock using an advanced Bayesian approach observed life-years gained with albumin relative to crystalloid therapy, and concluded that albumin may be the most cost-effective intravenous solution in this patient population.

CONCLUSION

Hypoalbuminemia was commonly found in the admitted patients in the hospital’s intensive care unit (ICU). In the severity of disease, albumin has main role. Serum albumin’s measurement at the time of admission in the ICU could be utilized as the biomarker clinical in order to facilitate the recognition of high-risk patient groups. Further prospective randomized controlled trials are needed patients who are critically ill in order to evaluate the exact place of albumin in the intensive care unit (ICU).

Author’s Contribution:
Concept & Design of Study: Abdul Zahir, Amir Baksh, Khalid Ahmed Tareen
Data Analysis: Muhammad Hussain, Baloch, Hamid Ali Kalwar, Muhammad Abid
Revisiting Critically: Abdul Zahir, Amir Baksh
Final Approval of version: Abdul Zahir

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

Assessment of Vitamin D Deficiency in Patients Presenting with Osteoarthritis in a Tertiary Care Hospital

Muhammad Abid, Khalid Ahmed Tareen, Muhammad Hussain Baloch, Amir Bakhsh, Hamid Ali Kalwar and Abdul Zahir

ABSTRACT

Objective: To measure the frequency of Vitamin D deficiency in those patients who are presenting with osteoarthritis in a tertiary healthcare unit.

Study Design: cross sectional (single center) study

Place and Duration of Study: This study was conducted at the General Medicine department at Liaquat National Hospital Karachi from July 2018 to Dec 2018.

Materials and Methods: Two hundred osteoarthritis patients were put into the inclusion criteria of this study. Then venous blood sample of each patient was obtained by using 5cc BD syringe. Samples were then sent to the hospital’s laboratory for assessment of level of vitamin D in blood. All procedures were noted on proforma.

Results: The mean age of the respondents came out to be 57.57±9.91 years. There were 121(60.5%) male and 79(39.5%) female. Vitamin D deficiency’s frequency in patients presenting with osteoarthritis was observed in 56% (112/200) patients.

Conclusion: High percentage of deficiency of vitamin D was revealed. Vitamin D deficiency’s frequency increased significantly with increasing age and was found to be greater in female patients. It is needed to take instant measures for tackling this increasing public health issue.

Key Words: Osteoarthritis, Vitamin D, serum 25-hydroxy vitamin D

INTRODUCTION

Osteoarthritis (OA) is a major public health issue that causes chronic pain and disability although at present the pathogenesis of this condition remains largely unknown. Several environmental factors have been associated with OA, including obesity previous injury knee-bending occupations and other metabolic factors.1 Throughout the body, Vitamin D has the major role to play in many places i.e. calcification and development of bones. Deficient serum levels of 25-hydroxy vitamin D (25-OHD) or vitamin D level affects the joint cartilage and it leads to progression and development of Osteoarthritis.2 It has been indicated that severity of bony pain is increased by the deficiency of vitamin D especially in females3.

The greater occurrence of deficiency of vitamin D indicated that greater number of adults who look healthy apparently are at risk of emerging musculoskeletal disorders and further chronic diseases.4 OA and deficiency of vitamin D, both are observed as the common health issues in elderly patients. Around 25% of people, whose age was greater than 55 years were suffering from knee pain on most of the days of month last year; from those people, around half of them were having radiographic knee OA; therefore, they were indicated to suffer from symptomatic OA.5 In Pakistan, 71.5 percent people are reported to suffer from the deficiency of vitamin D.6 One study reported that the vitamin D deficiency was present in 23.7% of cases with OA.7 One more study supported these results and reported that 24.5% cases of OA have vitamin D deficiency.8 But another study reported that vitamin D deficiency was present in 64.3% of cases with OA.9

Rationale of present research was to measure the frequency of deficiency of Vitamin D in patients having osteoarthritis in a tertiary healthcare center. Through. Literature, it was observed that the frequency of vitamin D deficiency is high among patients of OA. However, one study has reported very high rate of vitamin D deficiency in OA cases. It was also observed that the reported rate of vitamin D deficiency in local Pakistani population is high, but no study was found regarding the vitamin D deficiency in OA patients.
Therefore, this study was conducted in order to find the frequency of vitamin D deficiency in OA in local inhabitants. This would help us to gain local data and update guidelines to early diagnose and manage patients OA with vitamin D deficiency and can prevent the patients from severe conditions.

Criteria for the selection of patients

**Inclusion criteria:**
- Patients of 40-80 years age of either gender presenting with osteoarthritis (as per operational definition) for >6 months.
- Patient having minimum sun exposure of 30 min per day confirmed by history.

**Exclusion criteria:**
- Patients with history of inflammatory arthritis or any rheumatic disease rather than OA.
- Patients with medical record of celiac disease, malabsorption syndrome
- Patients taking medications known to affect 25-OH level (anticonvulsants, antituberculous drugs, 25-OHD, or analogues) or who used glucosamine, chondroitin, doxycycline, or intra-articular injections within 3 months.
- Patients with chronic medical conditions like hypertension (BP≥140/90mmHg), DM (BSR>186mg/dl and medical record), hypothyroidism (TSH>5IU/L), deranged LFT (ALT>40IU, AST>40IU) and RFT (creatinine>1.2mg/dl).
- Alcohol user or smoker.

**MATERIALS AND METHODS**

200 patients fulfilling selection criteria was selected through OPD of Department of Medicine, Liaquat National Hospital, and Karachi. Informed consent and demographics (name, age, gender, and contact) was obtained. Then venous blood sample of each patient was obtained by using 5cc BD syringe. Samples were then sent to the hospital’s laboratory of the hospital for the assessment of level of vitamin D in blood. Serum 25-OHD (vitamin D) was measured using radioimmunoassay kits DiaSorin (Stillwater, Minnesota, USA). Reports were assessed and vitamin D level was noted. Vitamin D deficiency was labeled if level was low, as per operational definition. All procedures were written on questionnaire/proforma (attached in the end).

**Statistical analysis:** Statistical Package for Social Sciences (SPSS) version 22 was used for the data analysis. Descriptive statistics (mean + standard deviation) of the quantitative variables i.e. age, duration of OA, duration of sun exposure and vitamin D level was calculated. All qualitative variables i.e. gender, nature of job and vitamin D deficiency was presented in the form of count and percentages. Data was stratified for age (45-60, 61-75, >75 years), gender (male, female), duration of OA (1-5, 6-10, 11-15, >15 years) duration of sun exposure, nature of job and severity of pain (on VAS 3-7, 8-10). Chi-square test was applied to compare the stratified groups, and to see the effect on outcome variable.

**RESULTS**

Two hundred osteoarthritis patients were included in this study. It was observed that most of the patients were 45 to 75 years of age as presented in figure-1. The average age of the patients was 57.57±9.91 years. Mean duration of osteoarthritis and pain score was 10.34±4.02 years and 5.03±0.82. Similarly mean duration of sun exposure, and vitamin D level of the patients is also given in table 2. There were 121(60.5%) male and 79(39.5%) female as shown in Table-2. Most of the patients were doing indoor job as shown in figure-2.
Table No.1: Descriptive statistics of study patients n=200

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean ± SD</th>
<th>95% Confidence Interval for Mean Lower Bound</th>
<th>95% Confidence Interval for Mean Upper Bound</th>
<th>Median (IQR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (Years)</td>
<td>57.57±9.91</td>
<td>56.18</td>
<td>58.95</td>
<td>56(14)</td>
</tr>
<tr>
<td>Duration of sun exposure (minutes)</td>
<td>14.48±10.02</td>
<td>13.08</td>
<td>15.88</td>
<td>20(20)</td>
</tr>
<tr>
<td>Duration of Osteoarthritis (Years)</td>
<td>10.34±4.02</td>
<td>9.77</td>
<td>10.90</td>
<td>10(4)</td>
</tr>
<tr>
<td>Pain</td>
<td>5.03±0.82</td>
<td>4.92</td>
<td>5.14</td>
<td>5(1)</td>
</tr>
<tr>
<td>Vitamin D3 Level (ng/ml)</td>
<td>11.09±6.92</td>
<td>10.12</td>
<td>12.05</td>
<td>8(10)</td>
</tr>
</tbody>
</table>

Table No.2: Frequency of vitamin D deficiency in patients presenting with osteoarthritis with respect to age groups and gender n=200

<table>
<thead>
<tr>
<th>Age Groups (Years)</th>
<th>Vitamin D Deficiency</th>
<th>Total</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;45 Years</td>
<td>Yes (n=112)</td>
<td>7(36.8%)</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>No (n=88)</td>
<td>12(63.2%)</td>
<td></td>
</tr>
<tr>
<td>46 to 60 Years</td>
<td>Yes (n=112)</td>
<td>68(58.1%)</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>No (n=88)</td>
<td>49(41.9%)</td>
<td></td>
</tr>
<tr>
<td>61 to 75 Years</td>
<td>Yes (n=112)</td>
<td>26(52%)</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>No (n=88)</td>
<td>24(48%)</td>
<td></td>
</tr>
<tr>
<td>&gt;75 Years</td>
<td>Yes (n=112)</td>
<td>11(78.6%)</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>No (n=88)</td>
<td>3(21.4%)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gender</th>
<th>Vitamin D Deficiency</th>
<th>Total</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>Yes (n=112)</td>
<td>56(46.3%)</td>
<td>121</td>
</tr>
<tr>
<td></td>
<td>No (n=88)</td>
<td>65(53.7%)</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>Yes (n=112)</td>
<td>56(70.9%)</td>
<td>79</td>
</tr>
<tr>
<td></td>
<td>No (n=88)</td>
<td>23(29.1%)</td>
<td></td>
</tr>
</tbody>
</table>

Frequency of vitamin D deficiency in patients presenting with osteoarthritis was observed in 56% (112/200) patients as shown in figure-3. Rate of vitamin D deficiency was high in above 75 years of age but there were no significant difference among different age groups as shown in table 2. Rate of vitamin D deficiency was significantly high in female as compare to male (p=0.001, table 2). Similarly rate of vitamin D deficiency was also significantly high in those cases who was working indoor job and those who are not doing job (p=0.0005) likely vitamin D deficiency was also high in those patients whose sun exposure was less than 10 minutes (p=0.0005) and duration of OA was above 10 years (p=0.0005) as shown in table 3 and 4 respectively. Rate of vitamin D deficiency was not significant with respect to pain score as shown in table 4.

Table No.3: Frequency of vitamin D deficiency in patients presenting with osteoarthritis with respect to job nature and duration of sun exposure n=200

<table>
<thead>
<tr>
<th>Job Nature (Occupation)</th>
<th>Vitamin D Deficiency</th>
<th>Total</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indoor Job</td>
<td>Yes (n=112)</td>
<td>83(64.3%)</td>
<td>129</td>
</tr>
<tr>
<td></td>
<td>No (n=88)</td>
<td>46(35.7%)</td>
<td></td>
</tr>
<tr>
<td>Outdoor job</td>
<td>Yes (n=112)</td>
<td>13(29.5%)</td>
<td>44</td>
</tr>
<tr>
<td></td>
<td>No (n=88)</td>
<td>31(70.5%)</td>
<td></td>
</tr>
<tr>
<td>No Job</td>
<td>Yes (n=112)</td>
<td>16(59.3%)</td>
<td>27</td>
</tr>
<tr>
<td></td>
<td>No (n=88)</td>
<td>11(40.7%)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Duration of SUN EXPOSURE</th>
<th>Vitamin D Deficiency</th>
<th>Total</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;10 minutes</td>
<td>Yes (n=112)</td>
<td>45(76.3%)</td>
<td>59</td>
</tr>
<tr>
<td></td>
<td>No (n=88)</td>
<td>14(23.7%)</td>
<td></td>
</tr>
<tr>
<td>10 to 20 minutes</td>
<td>Yes (n=112)</td>
<td>53(57%)</td>
<td>93</td>
</tr>
<tr>
<td></td>
<td>No (n=88)</td>
<td>40(43%)</td>
<td></td>
</tr>
<tr>
<td>21 to 25 minutes</td>
<td>Yes (n=112)</td>
<td>14(29.2%)</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td>No (n=88)</td>
<td>34(70.8%)</td>
<td></td>
</tr>
</tbody>
</table>

Table No.4: Frequency of vitamin D deficiency in patients presenting with osteoarthritis with respect to duration of osteoarthritis and pain n=200

<table>
<thead>
<tr>
<th>Duration of OA</th>
<th>Vitamin D Deficiency</th>
<th>Total</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 5 Years</td>
<td>Yes (n=112)</td>
<td>10(45.5%)</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>No (n=88)</td>
<td>12(54.5%)</td>
<td></td>
</tr>
<tr>
<td>6 to 10 Years</td>
<td>Yes (n=112)</td>
<td>36(40.9%)</td>
<td>88</td>
</tr>
<tr>
<td></td>
<td>No (n=88)</td>
<td>52(59.1%)</td>
<td></td>
</tr>
<tr>
<td>11 to 15 Years</td>
<td>Yes (n=112)</td>
<td>53(70.7%)</td>
<td>75</td>
</tr>
<tr>
<td></td>
<td>No (n=88)</td>
<td>22(29.3%)</td>
<td></td>
</tr>
<tr>
<td>&gt;15 Years</td>
<td>Yes (n=112)</td>
<td>13(86.7%)</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>No (n=88)</td>
<td>2(13.3%)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pain</th>
<th>Vitamin D Deficiency</th>
<th>Total</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 to 7</td>
<td>Yes (n=112)</td>
<td>98(55.4%)</td>
<td>177</td>
</tr>
<tr>
<td></td>
<td>No (n=88)</td>
<td>79(44.6%)</td>
<td></td>
</tr>
<tr>
<td>8 to 10</td>
<td>Yes (n=112)</td>
<td>14(60.9%)</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td>No (n=88)</td>
<td>9(39.1%)</td>
<td></td>
</tr>
</tbody>
</table>

DISCUSSION

Osteoarthritis (OA) was thought to be a typical outcome of being aged before, which lead to "degenerative joint ailment.” However, it is presently understood that osteoarthritis is the outcome of the interaction of various variables i.e. genetics, joint integrity, mechanical forces, local inflammation and cellular biochemical procedures. With the increasing age the
cartilage volume is decreased, proteoglycan can content, vascularization of cartilage, and perfusion of cartilage. These progressions may result in different radiologic characteristics i.e. marginal osteophytes limited joint space. Notwithstanding, from the biochemical and pathophysiologic discoveries bolster the idea that age alone is a deficient reason for osteoarthritis.

Number incorporated patients in this study was 200. The age of the respondents was from 40-80 years. We saw that the greater part of the patients were from the age of 45 to 75 years and their mean age came out to be 57.57±9.91 years. Based on the osteoarthritis’s radiographic criteria, >50% older patients than 65 are suffering from this disease. Symptoms regularly don’t wind up observable until after the human come to the age of 50 years. The commonness of the disease increments drastically among people whose age is >50 years, in the same way, due to the modifications because of the age in proteoglycans and collagen that reduce the elasticity of the joint ligament and in view of a lessened supply of vitamin to the cartilage. In people whose age is more than 55 years, the pervasiveness of osteoarthritis is greater in females as compared to that in males. Women likewise have the knee joints’ osteoarthritis of more much of the time than men do, with a female-to-male frequency proportion of 1.7:1. Ladies are additionally more inclined to erosive osteoarthritis, with a female-to-male proportion of around 12:1. On the contrary, it was revealed in this research that the percentage of suffering males and females from osteoarthritis was taken out to be 60.5% and 39.5% respectively.

Vitamin D has numerous natural capacities in these structures by following up on the receptors of vitamin D, and might have the useful effects on these structures of joint in OA. Vitamin D adequacy is evaluated by estimating concentrations of 25-hydroxy vitamin D (25[OH]D or calcidiol). In present research, it was indicated that if the concentration of vitamin D was <10 ng/mL or <40 nmol/L of blood test. The ideal serum 25(OH)D level for the prevention of OA is >30 ng/mL (75 to 125 nmol/L). Vitamin D frequency inadequacy in patients giving osteoarthritis was seen in 56% patients in our investigation. Lower serum vitamin D has been appeared to be related with OA in numerous investigations. In a recent report in Ireland (2010) of rheumatology outpatients, 70% were observed to be vitamin D insufficient (<21 ng/mL) and 26% were extremely lacking (<12 ng/mL). The investigation likewise noted 62% of OA patients experienced hypovitaminosis D and 13% were extremely influenced. As a major aspect of the Osteoporosis Fractures in male study in the United States, research found a high commonness of vitamin D inadequacy or deficiency in hip OA patients and revealed that these patients were twice as probable for having hip OA. An Iranian investigation indicated a positive relationship between serum 25(OH)D3 and knee OA in patients below the age of 60 years and noticed a more grounded relationship in participants who were younger in age. Contrary to these outcomes an extensive partner investigation of 5,274 free from OA demonstrated that low serum 25(OH)D3 levels were not related with an expanded danger of creating hip or knee OA over the period of 10 years. For bone health vitamin D is quite useful and causes the mortality reduction elderly females. We found that the rate of vitamin D insufficiency was essentially high in female in the comparison of males.

As indicated by surveys that has been carried out in our country, over 85 percent of both pregnant and non-pregnant moms have been indicated to be vitamin D deficient. Another investigation from that city (Faisalabad) revealed greatest commonness vitamin D inadequacy in females. Research demonstrated that 87% of pregnant females were suffering from the deficiency of Vitamin D, 10% were suffering from the problem of insufficiency of vitamin D, while just 3% of the females had the normal levels of vitamin D. Another research from Karachi, Pakistan in 305 premenopausal females, indicated 90.1% vitamin D deficiency.

Vitamin D is usually called as "the daylight vitamin", and all things considered. It is produced in the human’s skin and different warm-blooded creatures when presented to daylight. The time which is needed to yield vitamin D from the skin relies upon the quality of the UVB beams (i.e., place of living arrangement), the time span spent under the sun, and the measure of shade in the skin. In consideration of these announcements, correlation was found between the deficiency of vitamin D and the exposure to sunlight in this research. Vitamin D deficiency rate was altogether high in those cases who were not exposed to sunlight because of not having any job or having indoor job; and it was likewise high patients who were having the exposure of sun light <10 minutes (p=0.0005) and length of OA was over 10 years.

**CONCLUSION**

High percentage of deficiency of vitamin D was revealed. Vitamin D deficiency’s frequency increased significantly with increasing age and was found to be greater in female patients. It is needed to take instant measures for tackling this increasing public health issue.

**Author’s Contribution:**

**Concept & Design of Study:**

Muhammad Abid
Khalid Ahmed Tareen,
Muhammad Hussain
Baloch

**Data Analysis:**

Amir Bakhsh, Hamid Ali
Kalwar, Abdul Zahir
REFERENCES


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Scientific Writing: Hands-on Workshop Analysis Among the Faculty of Medical Sciences

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ABSTRACT

Objective: To analyze the pre and post hands-on workshop analysis of faculty members related to medical sciences regarding scientific writing

Study Design: Cross sectional analytical study

Place and Duration of Study: This study was conducted at the faculty of Medical Sciences in Al-Tibri Medical College and Hospital, Isra University Karachi Campus from January 2020 to May 2020.

Materials and Methods: After an ethical approval, total 50 number of faculty members of medical sciences were enrolled in research based workshop on the basis of convenient sampling. The workshop was conducted in three different phases and equally divides the faculty into groups. Before the workshop, the participants were given verbal consent and fill the pre-workshop questionnaire and after completion of hands-on workshop the similar questionnaire was filled by the participants. Now the pre and post workshop data was collected and presented in the form of frequency and percentage of response given by the participants and Chi-square test was applied to draw the significant difference between pre and post analysis. The level of significance was taken P=<0.05

Results: The significant difference (P value <0.01) were analyzed through pre and post workshop analysis in all component of the questionnaire

Conclusion: The study results revealed the significant difference in pre and post analysis of faculty members, they are lacking in quality when it comes to knowledge and writing skills in scientific writing, however, if workshops are conducted regularly they will develop skills necessary to write better literature and submit their work in different publications for appraisal. Research excellence department should be established for the faculty development

Key Word: Scientific Writing, Workshop, Medical Sciences


INTRODUCTION

"Every secret of a writer's soul, every experience of his life, every quality of his mind, is written largely in his works." Writing isn't easy, but it is essential. The same can also be said in the field of medicine, which requires doctors' to write and publish their articles in the field of medicine to keep the world as well as their colleagues up to date with the latest research that is ongoing. Clear communication is vital to sustaining the ever-evolving field of research\textsuperscript{1}.

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literature which can be accepted into peer-reviewed medical journals. Having seen that most of our colleagues and residents do not have the proper knowledge as well as skill when it comes to writing a scientific paper, we decided to conduct a hands-on workshop on scientific writing among the faculty of medical sciences and see what the outcomes might be.

MATERIALS AND METHODS

After taking approval of the ethical committee, a cross-sectional analytical study was conducted between the duration of January 2020 to May 2020 among the faculty of medical sciences in Al-Tibri Medical College and Hospital, Isra University Karachi Campus. Total 50 number of faculty members of medical sciences were enrolled in research based workshop on the basis of convenient sampling. The workshop was conducted in three different phases and equally divides the faculty into groups. Before the workshop, the participants were given verbal consent and fill the pre-workshop questionnaire and after completion of hands-on workshop the similar questionnaire was filled by the participants. Now the pre and post workshop data was collected and presented in the form of frequency and percentage of response given by the participants and Chi-square test was applied to draw the significant difference between pre and post analysis. The level of significance was taken P=<0.05.

RESULTS

Figure 1: shows the percentage of Gender based distribution of the participants. Figure 2: shows the frequency of participants according to designation. Figure 3 shows percentage of the participants in respect to their research skills. Table 1: shows the frequency and percentage of the faculty members response in accordance with questionnaire regarding basics of scientific writing, a pre and post hands-on workshop analysis with level of significance.

Table No.1: shows the frequency and percentage of the faculty members response in accordance with questionnaire regarding basics of scientific writing, a pre and post hands-on workshop analysis with level of significance

<table>
<thead>
<tr>
<th>Questionnaire (Basics of scientific writing)</th>
<th>Pre-workshop</th>
<th>Post workshop</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you aware about the authorship criteria of ICMJE?</td>
<td>34(68%)</td>
<td>49(98%)</td>
<td>1(2%)</td>
</tr>
<tr>
<td>Do you know the types of data used in research?</td>
<td>28(56%)</td>
<td>48(96%)</td>
<td>2(4%)</td>
</tr>
<tr>
<td>Do you having knowledge about the test of significance that is applied for data analysis?</td>
<td>18(36%)</td>
<td>43(86%)</td>
<td>7(14%)</td>
</tr>
<tr>
<td>Can you describe different types of variable?</td>
<td>18(36%)</td>
<td>48(96%)</td>
<td>2(4%)</td>
</tr>
<tr>
<td>Do you know how we can search the literature?</td>
<td>24(48%)</td>
<td>50(100%)</td>
<td>0(0%)</td>
</tr>
<tr>
<td>Do you understand the difference between Null and alternate hypothesis?</td>
<td>22(44%)</td>
<td>49(98%)</td>
<td>1(2%)</td>
</tr>
<tr>
<td>Can you describe the methods using for testing of hypothesis?</td>
<td>16(32%)</td>
<td>46(92%)</td>
<td>4(8%)</td>
</tr>
<tr>
<td>Do you know the rationale of the study?</td>
<td>19(38%)</td>
<td>45(90%)</td>
<td>5(10%)</td>
</tr>
<tr>
<td>Can you describe the different sampling methods?</td>
<td>17(34%)</td>
<td>42(84%)</td>
<td>8(16%)</td>
</tr>
<tr>
<td>Do you known how to analyze the data through SPSS?</td>
<td>16(32%)</td>
<td>40(80%)</td>
<td>10(20%)</td>
</tr>
<tr>
<td>Can you differentiate between variable and reliable?</td>
<td>20(40%)</td>
<td>48(96%)</td>
<td>2(4%)</td>
</tr>
<tr>
<td>Do you know what plagiarism is and how to avoid it?</td>
<td>24(48%)</td>
<td>49(98%)</td>
<td>1(2%)</td>
</tr>
<tr>
<td>Can you write references of journal article, book chapter in Vancouver style?</td>
<td>17(34%)</td>
<td>41(82%)</td>
<td>9(18%)</td>
</tr>
<tr>
<td>Do you know what is meant by Letter of Undertaking?</td>
<td>21(42%)</td>
<td>47(94%)</td>
<td>3(6%)</td>
</tr>
</tbody>
</table>

Chi-square test applied  
Level of significance P=<0.05
DISCUSSION

The data shows that the participants have a lacking when it comes to writing a manuscript, these workshops however saw significant improvement in their knowledge when it comes to manuscript writing demonstrating the need for such types of workshops in the future. In a similar study conducted on students, postdoctoral trainees, and assistant professors, the participants learned progressively when it comes to the principle of clear, scientific writing and also went on to actively apply these principles. A significant difference was seen when it came towards knowledge regarding plagiarism and how it can be avoided.  Failure to reference words of another writer is considered to be plagiarism and is considered to be a form of cheating. Plagiarism is becoming more due to the easy access of the internet and is widely considered to be the cause of retraction for publications. Faculty members need to be taught about the significance of plagiarism and how it might affect their publications from not being accepted in reputable medical journals nationally and internationally. There isn't be significant reporting globally concerning plagiarism in low resource countries, however, it is argued that it may be prevalent in countries such as Pakistan due to "a general lack of information regarding plagiarism among medical students and faculty members". Referencing is also seen to be another thing that most of the participants weren't aware of before the workshops were conducted. This lack of referencing skills can also be seen in other studies in connection to the issue of plagiarism. The art of avoiding plagiarism and writing proper referencing is a skill and this study can demonstrate that the participants are significantly lacking in both of these aspects of medical writing. Another study also highlighted the same two aspects showing that there is an issue of misconceptions and disagreements both among students and supervisors. Although there was a significant enhancement in the knowledge of how to reference using the proper style of referencing, more workshops are required to enhance their skills concerning referencing. Overall, there was a lack of knowledge when it came to proper medical writing among the participants but after the workshop had concluded we saw a significant improvement regarding knowledge of scientific writing among the members. A similar study demonstrated the same thing that a development workshop can help to facilitate writing productivity and presentation of scholarly work in medical education, as participants of that study after the workshops went onto to submit 14 manuscripts into different publications (11 of them were accepted) and presented a total of 38 abstracts at educational conferences. More type of these workshops not just for faculty members but also for undergraduate students is necessary so that they may develop timely skills when it comes to writing a good paper.

CONCLUSION

This study suggests that most of the faculty members of medical sciences don’t possess adequate knowledge when it comes to writing a good medical manuscript. If workshops are conducted regularly and if proper knowledge and teaching are given to the members of the faculty, they will have a better opportunity in delivering medical literature that can be published in reputable journals. However, more studies need to be conducted in other universities to assess if their faculty is also aware of the fundamentals of scientific writing. The study results revealed the significant difference in pre and post analysis of faculty members, they are lacking in quality when it comes to knowledge and writing skills in scientific writing, however, if workshops are conducted regularly they will develop skills necessary to write better literature and submit their work in different publications for appraisal. Research excellence department should be established for the faculty development.

Author’s Contribution:
Concept & Design of Study: Hina Khan
Drafting: Umer Kazi, Asad Raza Jiskani
Data Analysis: Bushra Zulfiqar, Ghazala Panhwar, Erum Saboo hi
Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES
Iron Profile and Clinical Patterns of Anemia Among Medical College Students

Umair Ali Soomro¹, Shumaila Shaikh³, Sadia Tabassum⁴, Shumail Saeed Siddiqui², Shagufta Memon⁴ and Kashif Rasheed Shaikh⁶

ABSTRACT

Objective: To determine the iron profile and clinical patterns of anemia in young medical college students,

Study Design: Observational study

Place and Duration of Study: This study was conducted at the Department of Pathology, Indus Medical College, T.M. Khan, Sindh, Pakistan from January 2018 to September 2019.

Materials and Methods: A sample of 167 medical students was selected by non – probability convenient sampling. Volunteers were asked for blood sampling. 5 ml blood was drawn in disposable syringe. 2 ml was taken in EDTA tubes for the hematological indices and 3 ml was centrifuged to get sera for the estimation of serum iron, ferritin, TIBC and TSAT. Data was analyzed on SPSS 21.0 (USA) at 95% CI (P≤ 0.05).

Results: Of 167 students; 99 (59.2%) were male and 68 (40.7%) were female. Age of male was 21.43±1.83 and female was 21.71±2.17 years (P=0.39). Normal and low serum Iron levels were noted in 60 (66.6%) vs. 31 (45.5%) of male and female respectively. Normocytic, microcytic and macrocytic anemia were noted in 24 (54.5%) vs. 19 (45.5%) of male and female respectively.

Conclusion: The present study reports high frequency of low iron profile and anemia in young medical students.

Key Words: Anemia, Iron, Ferritin, Medical college

INTRODUCTION

Anemia is defined as reduced hemoglobin, hematocrit (Hct) or red blood cell counts (RBC) below baseline levels. Iron deficiency (ID) is most common type of nutritional anemia prevalent Worldwide. Previous estimates show 2.15 billion people are suffering from Iron deficiency anemia (IDA) and commonly affected are the children and women particularly in the developing countries.¹ World Health Organization (WHO) defined cut off values for anemia in under 5 five children and pregnant women as Hb <11 g/dl, for non – pregnant women <12 g/dl and for men <13 g/dl. Highest prevalence of IDA is observed in South Asia and Africa showing 40% IDA in all age groups.³

Dietary deficiency and worm infestations are common cause of IDA in developing countries. Other causes are; vegans, malabsorption, chronic blood loss, etc.⁴ Hematological indices of IDA include low Hb, Hematocrit (Hct), red blood cell (RBC) counts, mean corpuscular volume (MCV), mean corpuscular hemoglobin (MCH), and mean corpuscular hemoglobin concentration (MCHC).⁵ Early stages of ID may be evaluated by serum ferritin, serum iron levels, total iron binding capacity (TIBC) and Transferrin saturation (TSAT). Commonest screening methods are the Hb, Hct and RBC counts, but these may be normal in earlier stages of ID.⁶ However, these hematological indices have their limitations especially in earlier stages of ID. The Hb, Hct MCV, MCH and MCHC are slow and insensitive as early indicators of IDA. However, the serum ferritin, TIBC and TSAT are more sensitive.⁷ In Pakistan, the iron deficiency is prevalent as reported.⁸ Although the serum iron and ferritin are expensive but it is reasonable to assume that developing countries population with high anemia prevalence is also likely to have a high prevalence of iron deficiency.⁹ In this context, the iron profile needs further research. Keeping this scenario of prevalent ID and IDA; the present research was conducted to analyze the clinical patterns of anemia and iron profile among the medical students of Indus Medical College. The present research analyzed the serum iron, serum ferritin, total iron binding capacity (TIBC) and Transferrin saturation (TSAT) levels.
MATERIALS AND METHODS
An observational study was conducted at the Department of Pathology, Indus medical College, T.M. Khan, Sindh, Pakistan, from Indus Medical College, T.M. Khan, Sindh, Pakistan. A sample of 167 medical students was selected by non – probability convenient sampling. Sample comprised of 99 male and 68 female medical students. Participants were selected by non-probability (convenient) sampling inclusion and exclusion criteria. Medical students of 1st – 3rd years, age 18 – 25 years and both male and female health looking were inclusion criteria. Medical student with diabetes mellitus, chronic diarrhea, pulmonary tuberculosis, chronic liver disease, taking gutkha, manipuri, betel nuts, pan, etc were excluded. A student taking multivitamin and minerals pills was exclusion criteria. Participants were negotiated of the purpose of research. Participants were informed of full compliance of research protocol voluntarily. Biodata of students was taken, examined physically to exclude major systemic disease, and blood samples were collected. Prominent vein in ante – cubital fossa was chosen for venesection, drawing 5 ml blood after area was sterilized by alcohol swab. Of 5 ml blood; 2 ml was taken in EDTA tubes for the hematological indices and 3 ml was centrifuged to get sera for the estimation of serum iron, ferritin, TIBC and TSAT. Sera were obtained by centrifugation at 3000 x rpm for 15 minutes. Hematological indices included red blood cell counts and indices; hemoglobin, hematocrit, mean corpuscular volume (MCV), mean corpuscular hemoglobin (MCH) and mean corpuscular hemoglobin concentration (MCHC). Serum iron, ferritin, total iron binding capacity (TIBC), and Transferrin saturation (TSAT) were detected from the sera. Ferritin was measured by Immulite – assay kit (Chemiluminescent system, UK). Cobas e 411 Roche Diagnosis GmbH, Mannheim, Germany analyzer was used for the biochemical testing. Confidentiality was maintained and variables were entered in a proforma. Statistical comparisons of continuous variables was performed by the Student’s t-test (Independent sample t – test) and categorical variables by Chi – square test (Cross tabulation). Data was analyzed at 95% Confidence interval (P< 0.05).

RESULTS
Of 167 students; 99 (59.2%) were male and 68 (40.7%) were female. The age of male was 21.43±1.83 and female was 21.71±2.17 years (P=0.39). Hemoglobin, Hct (%), RBC, MCV, MCH and MCHC are shown in table 1. The difference between male and female was statistically significant (P<0.05). Serum Fe++ in male and female was 129.59±15.82 μg/dl and 107.54±22.55 μg/dl (P=0.0001). Serum Ferritin was 124.64±17.63 ng/dl in male and 103.58±19.50 ng/dl in female (P=0.0001).

Table No1: Hematological and Iron Indices of study subjects (n=167)

<table>
<thead>
<tr>
<th></th>
<th>Male (n=99)</th>
<th>Female (n=68)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>21.43±1.83</td>
<td>21.71±2.17</td>
<td>0.39</td>
</tr>
<tr>
<td>Hemoglobin (g/dl)</td>
<td>13.05±2.91</td>
<td>12.81±2.52</td>
<td>0.0001</td>
</tr>
<tr>
<td>Hematocrit (%)</td>
<td>43.82±5.16</td>
<td>41.5±9.10</td>
<td>0.0001</td>
</tr>
<tr>
<td>RBC counts (x10^6/μL)</td>
<td>4.15±0.22</td>
<td>3.97±0.91</td>
<td>0.0001</td>
</tr>
<tr>
<td>MCV (fl)</td>
<td>76.8±11.3</td>
<td>71.5±12.04</td>
<td>0.0001</td>
</tr>
<tr>
<td>MCH (pg)</td>
<td>27.8±4.22</td>
<td>24.1±5.7</td>
<td>0.0001</td>
</tr>
<tr>
<td>MCHC (%)</td>
<td>26.3±2.14</td>
<td>25.7±2.29</td>
<td>0.0001</td>
</tr>
<tr>
<td>Serum Fe++(μg/dl)</td>
<td>129.59±15.82</td>
<td>107.54±22.55</td>
<td>0.0001</td>
</tr>
<tr>
<td>Serum Ferritin (ng/dl)</td>
<td>124.64±17.63</td>
<td>103.58±19.50</td>
<td>0.0001</td>
</tr>
<tr>
<td>Serum TIBC (μg/dl)</td>
<td>251.97±33.25</td>
<td>305.74±63.54</td>
<td>0.0001</td>
</tr>
<tr>
<td>TSAT (%)</td>
<td>35.09±7.77</td>
<td>28.82±8.49</td>
<td>0.0001</td>
</tr>
</tbody>
</table>

TSAT – Transferrin Saturation

Table No2: Frequency of Iron levels (n=167)

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal levels</td>
<td>60 (66.6%)</td>
<td>31 (45.5%)</td>
<td>0.0001</td>
</tr>
<tr>
<td>Iron deficiency</td>
<td>39 (39.3%)</td>
<td>37 (54.5%)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>99 (100%)</td>
<td>68 (100%)</td>
<td></td>
</tr>
</tbody>
</table>

Table No3: Clinical types of Anemia among students (n=167)

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normocytic normochromic</td>
<td>63 (63.6%)</td>
<td>29 (42.64%)</td>
<td>0.0001</td>
</tr>
<tr>
<td>Microcytic hypochromic</td>
<td>25 (25.2%)</td>
<td>31 (45.5%)</td>
<td>0.0001</td>
</tr>
<tr>
<td>Macrocytic hyperchromic</td>
<td>11 (11.1%)</td>
<td>8 (11.7%)</td>
<td>0.0001</td>
</tr>
<tr>
<td>Total</td>
<td>99 (100%)</td>
<td>68 (100%)</td>
<td></td>
</tr>
</tbody>
</table>
TIBC was elevated in female 305.7±63.54 μg/dl with low TSAT (%) 28.82±8.49 compared to male TIBC 251.97±33.25 μg/dl and TSAT (%) 35.09±7.77 (P=0.0001). Normal and low serum Iron levels were noted in 60 (66.6%) vs. 31 (45.5%) and 39 (39.3%) vs. 37 (54.5%) of male and female respectively (table – 2). Normocytic, microcytic and macrocytic anemia were noted in 63 (63.6%), 25 (25.2%) and 11 (11.1%) of male compared to 29 (42.64%), 31 (45.5%) and 8 (11.7%) of female respectively.

Graph No.1: Gender distribution

DISCUSSION

The present observational study is the first study being reported on the clinical patterns of anemia and iron profile among medical college students of Indus Medical College, T.M. Khan, Sindh. Of 167 students; 99 (59.2%) were male and 68 (40.7%) were female. The age of male was 21.43±1.83 and female was 21.71±2.17 years (P=0.39). Our findings are keeping with previous studies. A study from Peshawar by Khan MT et al reported mean age of 21.9±2.3 years that is consistent finding. The hemoglobin, Hct (%), RBC, MCV, MCH and MCHC differed significantly between male and female students (P<0.05). These findings are in agreement with previous studies. No significant difference was observed in other hematological parameters among the two groups of students. The present study observed low Hb, Hct, RBC counts, serum Fe++, serum TIBC and serum ferritin levels in both male and female students, however, the female students show statistically low iron indices (P=0.0001). The findings are in keeping with previous studies. Normal and low serum Iron levels were noted in 60 (66.6%) vs. 31 (45.5%) and 39 (39.3%) vs. 37 (54.5%) of male and female respectively (table – 2). The findings are supported by previous studies. In present study, the serum ferritin in male and female was 129.59±15.82 μg/dl and 107.54±22.55 μg/dl (P=0.0001). Serum Ferritin was 124.64±17.63 ng/dl in male and 103.58±19.50 ng/dl in female (P=0.0001). TIBC was elevated in female 305.7±63.54 μg/dl with low TSAT (%) 28.82±8.49 compared to male TIBC 251.97±33.25 μg/dl and TSAT (%) 35.09±7.77 (P=0.0001). In developing countries, iron deficiency is an established public health problem and problem is compounded by the malnourishment. We found low serum iron (Fe++) and ferritin and high TIBC. RBC counts, hemoglobin and hematocrit were also found low in medical students. In present study, serum iron (Fe++), ferritin and TIBC in controls and cases were noted 152.7±6.08 and 118.79±43.30 μg/dl, 394.34±136.50 and 529.87±101.0 ng/dl, & 140.80±19.99 and 130.88±28.46 μg/dl respectively (P=0.0001). Our these findings are supported by previous studies. Because of many reasons the developing countries have high prevalence of iron deficiency (ID) and iron deficiency anemia (IDA). Serum ferritin is a source of iron that circulates in the blood plasma. Serum ferritin is a reliable marker of total iron stores. Low serum ferritin, TSAT, Fe++ and elevated TIBC were observed in the present study. The findings are in keeping with previous studies. Finding of low iron, ferritin, TSAT and elevated TIBC are supported by previous studies. Normocytic, microcytic and macrocytic anemia were noted in 63 (63.6%), 25 (25.2%) and 11 (11.1%) of female respectively. The findings are in keeping with previous studies. We conclude that iron malabsorption and the underlying nutritional iron deficiency needs to be elucidated. The limitations of present study are; small sample size and medical students of particular life style, hence the findings are not generalizable to other settings. However, the prospective study design is strength of study that needs further elaboration. Iron and anemia among medical students needs to be addressed and demands further studies.

CONCLUSION

The present study reports high frequency of low iron profile and iron deficiency anemia in young medical students. This needs further elaboration of iron profile studies in large sample of healthy medical college students for estimating the accurate gravity of iron and anemia related health problem.

Author’s Contribution:
Concept & Design of Study: Umair Ali Soomro
Drafting: Shumaila Shaikh, Sadia Tabassum
Data Analysis: Shumail Saeed Siddiqui, Shagufta Memon, Kashif Rasheed Shaikh
Revisiting Critically: Umair Ali Soomro, Shumaila Shaikh
Final Approval of version: Umair Ali Soomro

Conflict of Interest: The study has no conflict of interest to declare by any author.
REFERENCES

Introducing Hepatoprotective Effects of Pentoxifylline in Carbon Tetrachloride Induced Liver Injury in Rat Model

Kashif Rasheed Shaikh, Sadia Tabassum, Shumaila Shaikh, Shagufta Memon, Saeed Siddiqui, and Umair Ali Soomro

ABSTRACT

Objective: Investigating the hepatoprotective effects of Pentoxifylline (PTX) in carbon tetrachloride (CCl₄) induced liver injury in rat model.

Study Design: Experimental study

Place and Duration of Study: This study was conducted at the Animal house of Sindh Agriculture University Tando Jam and Isra University from January 2017 to August 2017.

Materials and Methods: 45 male rats were selected by purposive sampling through criteria of inclusion. Animals were housed in stainless steel cages under standard conditions. Rats were divided into Group A (control), Group B (CCl₄) and Group C (CCl₄ + PTX 200 mg/kg). Blood samples were centrifuged to get sera for the estimation of serum bilirubin, creatinine and liver enzymes. Liver tissue sections (3-5μ thickness) were stained with H & E and Microscopic tissue findings were noted. Statistical software SPSS version 22.0 (IBM corporation) was used for statistical analysis (P≤0.5).

Results: Serum bilirubin and creatinine in control group in experimental groups B and C were raised (P<0.05). Pentoxifylline treated group C rats revealed reduction of 65% in ALT, 58% in AST, 48% LDH and 71% ALP (P<0.05). Liver histology was also improved in PTX treated group C (P<0.05).

Conclusion: Pentoxifylline shows hepatoprotective potential against chemical induced liver injury, however mechanism of action remains to be elucidated.

Key Words: Carbon tetrachloride, Rat model, Liver injury, Pentoxifylline

INTRODUCTION

The Pentoxifylline (PTX) is one of the methylxanthine drugs that have been used in clinical practice for the medicinal purpose. Sole indication of PTX is for the peripheral arterial diseases (PAD). PTX is used for treating the PAD for dilating the occluded arteries since decades back. PTX is prescribed as vasodilator agent for the dilating the arteries in PAD, particularly in those suffering from severe intermittent claudicating (IC).

It’s pharmacological effects are exerted through blockade of the phosphodiesterase-4 type (PDE-4) that leads to improvement in blood flow through microcirculation and clogged capillaries, perfusing the tissues better. Increased blood supply to tissues improves the cell functioning. Anti-inflammatory effect has been reported by previous studies. Anti-inflammatory effect has been exploited for treating the liver affections. Hepato protective effects have been proved in previous studies. Liver is a major glandular organ destined for metabolic reactions. Anatomically, it is described as the largest glandular organ of human body. The functional parenchyma cells are called the ‘hepatocyte’. Hepatocytes are engaged in the handling, distribution and re-distribution of digested food. Thus liver is metabolically active gland involved in biochemical reactions. Metabolic reactions of carbohydrate, protein and lipids are the major biochemical reactions. Beside this, liver is involved in the detoxification of toxins, poisons and drugs. It also scavenges and neutralizes oxygen derived free radicals, called the reactive oxygen species (ROS). Many of acute and chronic liver diseases have been caused by these ROS. The ROS are involved in causing inflammatory and non-inflammatory liver diseases. Inflammatory diseases include viral and alcoholic...
hepatitis; while non-inflammatory diseases include; ischemia/reperfusion induced liver injury, non-alcoholic steatohepatitis, non-alcoholic fatty liver disease, drug induced liver necrosis, and toxin induced hepatotoxicity and cholestasis. Anti tubercular drug toxicity has been observed commonly in the clinical practice. Many of xenobiotics are detoxified by the liver. Thus liver is the seat of detoxification mainly because of two reasons; first – it neutralizes the intestinal toxins reaching to it through the portal systemic circulations mixed in the digested and absorbed nutrients; and second – it is the major site of detoxification of toxins and drugs and their excretion through the entero-hepatic pathway. In cases of liver diseases, the toxins and drugs skip detoxification, enter portal-systemic circulation and interfere with the metabolic reaction in the body. Liver disease in experimental animal models of chemical induced injury have been studied for the hepatoprotective effect of drugs and herbs. One such liver disease model is induced by carbon tetrachloride (CCL4) to in animal models to analyze the hepatoprotective effects of drugs. Animal models are used for the deliberate induction of liver injury in laboratory animals for research purpose. Many drugs are tested in laboratory animals of their therapeutic significance. CCL4 induces hepatocellular damage through the ROS generation. The ROS damages cell membrane, and nucleus, etc through lipid peroxidation. ROS generation is one of the postulated mechanism of liver injury beside others. ROS medicated cell injury releases liver enzymes that are measured for research purpose. The ROS annihilates the hepatocyte cell membrane by oxidation and lipid peroxidation. Both, liver micro anatomy and physiological functions are altered CCL4 treated animal models. Microscopy shows the basic liver architecture in animal models. Cytoplasmic and mitochondrial enzymes leak into the systemic circulation that are measured for determining the extent of liver injury. Liver enzymes are biomarkers of liver injury in drug and toxin induced animal models. They are also of clinical value in monitoring and treating acute and chronic liver diseases.

In the present experimental study, carbon tetrachloride induced liver injury rat model was prepared for researching the pharmacotherapeutic effects of Pentoxifylline and its possible hepatoprotective effects were evaluated through the liver enzymes estimation.

MATERIALS AND METHODS

The present experimental study was conducted at the animal house of Sindh Agriculture University Tando Jam and Isra University on rat model. The study covered time period from January 2017 to August 2017. The research proposal for the present thesis based study was already taken from the ethical committee. Adult rats were selected by purposive sampling through criteria of inclusion of; body weight 150 – 200 grams, male rats, Wistar bred, active mobile and feeding well. While female rats and rats of different body weight, not feeding well, and feeling immobile and lazy were excluded from the study. Animals were kept under standard conditions. They were housed in stainless steel cages with nozzles of water bottles. Humidity and room temperature were held at 55-60% and 25 °C respectively. 12/12 hour dark light cycle was maintained. Water was available freely 24 hours. Similarly the diet was fresh chaw. Pentoxifylline was purchased from Pharmacy of the institute. It was given in doses of 200 mg/kg orally daily. Carbon tetrachloride was dissolved in olive oil in equal (1:1) ratio. It was given in dose of 1.9 ml/kg orally daily for 21 days. Rats were divided into control and experimental groups. Control group were tagged as Group A (n=15) - received 0.9% isotonic saline orally for 21 days, Experimental control Group B (n=15) – treated with CCL4 orally. Drug was mixed in olive oil for 21 days, and Experimental Group C (n=15) - rats were given CCL4 on alternate day + Pentoxifylline (200 mg/kg) orally daily for 21 days. The blood samples were collected by lancet from the retro orbital space at twenty four hours of experimental period. Blood was centrifuged to separate sera that were used for liver enzymes estimation. Liver enzyme assays kits were purchased and sera were run on Hitachi Chemistry Analyzer for the enzyme measurement. Serum Bilirubin, Serum Creatinine, ALT (Alanine transaminase), AST (Aspartate transaminase), ALP (Alkaline phosphatase) and LDH (lactate dehydrogenase) were estimated. Rats were sacrificed by cervical dislocation. Abdomen was dissected in midline, peritoneum was sectioned and liver was approached. Liver pieces were collected and stored in 4% formaldehyde filled plastic jars. Tissue pieces were embedded in paraffin blocks. Tissue sections of approximately 3-5μ thickness were prepared with microtome. Tissue sections were stained H & E (Haematoxylin and Eosin staining). Microscopic slides were prepared and mounted on light microscopy. Microscopic tissue findings were noted according to the grading of; normal = 0, mild tissue architecture injury = 1+, moderate tissue architecture injury = 2+, severe tissue architecture injury = 3+ and very severe tissue architecture injury = 4+. Mild, moderate, severe and very severe tissue injury was defined as swollen and pale cytoplasm, vacuolated cytoplasm, myelin sheaths, and pyknotic nuclei with eosinophilic cytoplasm respectively. Statistical software SPSS version 22.0 (IBM corporation) was used for statistical analysis, using one-way analysis of variance (1-ANOVA) for Gaussian distributed numerical variables. Post- Hoc Fischer LSD was used for difference between individual groups for continuous variables. Chi-square
test tested the categorical variables. Variable were analyzed at 95% confidence interval (P≤0.5).

**RESULTS**

Serum bilirubin, serum creatinine, alanine transaminase (ALT), aspartate transaminase (AST), lactate dehydrogenase (LDH) and alkaline phosphatase (ALP) are shown in the table 1. Results of experimental groups B and C were compared with control group A. Serum bilirubin in control group A was 0.73± 0.31 mg/dl compared to 6.12±1.91 mg/dl in group B and 4.01±1.13 mg/dl (P<0.05). Serum creatinine in control group A was 0.65 ± 0.21 mg/dl compared to 3.15±0.81 mg/dl in group B and 2.01±0.39 mg/dl (P<0.05). Pentoxifylline treated group C rats revealed a decrease of 65% in ALT, 58% in AST, 48% LDH and 71% ALP (P<0.05). Experimental group B revealed +3 to +4 grade very severe liver injury compared to +1 to +3 grade of severe liver injury in Pentoxifylline treated group C (P<0.05). Histological microphotographs 1-3 show the findings in groups A, B and C.

| Table No. 1: Bilirubin, Creatinine and Liver Enzymes in Animal Groups |
|--------------------------|-----------------|-----------------|---------------------|---------------------|
| Parameter                | Groups          | P-value         |
| S. Bilirubin (mg/dl)     | Group A         | 0.73± 0.31      | Group B             | 6.12±1.91           | 4.01± 1.13 | 0.0001 |
| S. Creatinine (mg/dl)    | Group A         | 0.65 ± 0.21     | Group B             | 3.15±0.81           | 2.01±0.39 | 0.0003 |
| Alanine transaminase (IU/L) | Group A         | 35.87±3.10      | Group B             | 199.7±11.9          | 131.3±11.3 | 0.0001 |
| Aspartate transaminase (IU/L) | Group A         | 41.07±3.11      | Group B             | 187.3±13.7          | 110.3±10.3 | 0.0001 |
| Lactate dehydrogenase (IU/L) | Group A         | 145.2±9.30      | Group B             | 435.3±21.5          | 210.3±31.73 | 0.0001 |
| Alkaline phosphatase (IU/L) | Group A         | 99.87±5.71      | Group B             | 189.6±11.01         | 135.1±15.3 | 0.0001 |

| Table No. 2: Histological findings in Animal Groups |
|--------------------------|-----------------|-----------------|---------------------|---------------------|
| Parameter                | Groups          | P-value         |
| Inflammation             | Group A         | 0               | Group B             | +4                  | +3 | 0.0001 |
| Congestion               | Group A         | 0               | Group B             | +3                  | +2 | 0.0003 |
| Vacuolar degeneration    | Group A         | 0               | Group B             | +4                  | +3 | 0.0011 |
| Pyknotic nuclei          | Group A         | 0               | Group B             | +4                  | +2 | 0.001  |
| Eosinophilic cytoplasm   | Group A         | 0               | Group B             | +4                  | +2 | 0.001  |
| Necrosis                 | Group A         | 0               | Group B             | +3                  | +1 | 0.0001 |

*0=normal, +1= mild injury, +2= moderate injury, +3 severe injury, +4 very severe injury

![Figure No.1: Microscopy of control group A showing normal anatomical architecture of liver](image1)

![Figure No.2: CCl₄ group showing distorted tissue architecture, inflammatory cell infiltrate and necrosis](image2)
DISCUSSION

The present experimental animal study investigated the hepatoprotective effects of Pentoxifylline (PTX) against chemical (CCl₄) induced liver injury in rat model. The present study reproved the hepatoprotective effects of Pentoxifylline (PTX) against chemical (CCl₄) induced liver injury. The findings are in agreement with previous studies.¹,⁴,⁵ The present study rejects null hypothesis (H₀) because the statistically significant differences were observed in both biochemical and histological markers of liver injury among control and experimental groups (P<0.05). The serum bilirubin and creatinine shows major improvement in the PTX treated rats group C compared to group B (P<0.05). The findings are in agreement with previous studies.¹,⁴,⁵ A previous study analyzed the hepatoprotective effects of Pentoxifylline in ecstasy treated liver damage and reported positive findings. The hepatoprotective effective of above study supports the finding of present study. Pharmacological efficacy of PTX has been reported in alcoholic hepatitis,¹³ hepatic encephalopathy,¹⁴,¹⁵ and hepatorenal syndrome.¹⁶ A previous study reported hepatoprotective effect similar to the present study. That previous study further added that the PTX prevents liver fibrosis through inhibition of cytokine and pro-collagen-1 gene expression, as both facilitate fibrosis. Another previous study reported pharmacological efficacy of PTX in non-alcoholic steatohepatitis (NASH) and non-alcoholic fatty liver disease (NALFD). They reported that the PTX ameliorates liver aminotransferase and PTX inhibits tumor necrosis factor-α (TNF-α) that is profibrinogenic cytokine. The findings amelioration of liver aminotransferase of above study is consistent with the present study as hepatoprotective effect has been observed as indicated by biochemical and histological parameters (table 1 and 2). The present study shows that the damage of liver caused by CCl₄ is evident by the rise in serum enzymes levels beside the histological changes in liver tissue. This is in agreement with previous studies¹⁹,²⁰ that reported the carbon tetrachloride is proven to cause liver damage with concomitant rise in liver enzymes that are the reliable indices of liver parenchyma damage and leakage of enzymes into general circulation.¹⁹,²⁰ In present study, the Pentoxifylline treated group C rats revealed a decrease of 65% in ALT, 58% in AST, 48% LDH and 71% ALP (P<0.05). Experimental group B revealed +3 to +4 grade very severe liver injury compared to +1 to +3 grade of severe liver injury in Pentoxifylline treated group C (P<0.05). These findings are in keeping with previous studies.¹⁷,²⁰ In carbon tetrachloride induced liver injury in group B shows severe rise in liver cytoplasmic and mitochondrial enzymes and liver tissue injury. This is in agreement with a previous study.²¹ Above study reported the carbon tetrachloride induces severe liver tissue injury with multifold rise in liver aminotransferase in experimental rats. The finding of severe rise in ALT, AST, LDH and ALP indicates severe cellular injury of liver with release of cytoplasmic and mitochondrial enzymes into the general circulation. This finding is in keeping with previous studies.¹⁷,²¹ The histological findings of inflammation, congestion, vacuolar degeneration, pyknotic nuclei, eosinophilic cytoplasm and necrosis was prominently observed in the carbon tetrachloride treated group B and these findings shows improvement in the PTX treated group C. Pyknotic nuclei and eosinophilic cytoplasm are indices of severe hepatocellular injury caused by carbon tetrachloride. These findings are in agreement with previous studies.²³,²⁴ The evidence based findings of present study correlates well with previous studies, hence PTX may be used for clinical purpose for those suffering from chemical induced liver injury.

CONCLUSION

It is concluded that the Pentoxifylline has hepatoprotective potential against chemical induced liver injury. However, mechanism of hepatoprotective effect of Pentoxifylline remains to be elucidated. Pentoxifylline may be used for those suffering from chemical induced liver injury.

Author’s Contribution:

Concept & Design of Study: Kashif Rasheed Shaikh
Drafting: Sadia Tabassum,
Shumaila Shaikh
Data Analysis: Shagufta Memon,
Shumail Saeed Siddiqui,
Umair Ali Soomro
Revisiting Critically: Kashif Rasheed Shaikh,
Sadia Tabassum
Final Approval of version: Kashif Rasheed Shaikh

Conflict of Interest: The study has no conflict of interest to declare by any author.
REFERENCES


INTRODUCTION

There are wide varieties of pedagogical tactics in medical sciences. The practice of medical education includes traditional as well as other techniques like media which hire online teaching methodologies and electronic learning styles. In terms of Electronic (e) learning styles or online learning styles includes the technology of electronic devices and media that have been utilized to teach the students.

In this method both facilitators as well students should have online facility so they both communicate with each other. Though, online teaching is not that easy and has many challenges with cumulative time limits and strains faced by teachers and students, not only that but to give a modified, better experience regarding self-directed learning, discovery of new techniques is necessary. Since past decade the demand of online teaching is increasing, in spite of this faculty participation in online teaching in relation to progress in the demand for online teaching is significantly low. The percentage of faculty with course development or online teaching without any experience is around 80%. This is because of difficulty in time management and workload, limited resources along with outdated technology, insufficient reimbursement for instruction and inadequate correlation with students are certain barriers faced by faculty during online teaching. There are many other factors like traditional and pedagogical barriers that play an important role. The costs of organization faced by faculty are higher. It is because of more expense in online courses than courses completed face to face along with that it acquires more effort to be done. For development and management of online teaching requires more time that increases the workload too. Additionally, nonexistence of student teacher relationship results in diminishing the social interaction.
that develops in classroom. In online teaching students cheating cannot be controlled effectively and its quality also diminished compared with traditional method because on various phases it becomes difficult to convey the concept efficiently results in decline of learning outcome. These are some factors included in pedagogical barriers. The infrastructure is also very important in online classes, unavailability of electricity on most of occasions, lack of Wi-Fi services cause’s hindrances\(^6\). In addition to that unapproachability of gadgets like laptops, software quality or desktops, absence of skills in operating computers declines the confidence, poor vision in integration are also some of the factors face by faculty\(^7\).

**MATERIALS AND METHODS**

This study includes 50 faculty members who worked in Al-Tibri medical college and hospital Karachi. This cross sectional study was held between February 2020 to June 2020. Ethical approval has been taken from the concerned ethical committee. Both genders were incorporated by means non-probability convenient sampling method. In this study the faculty members of clinical as well as basic sciences were included. In order to conduct the research a questionnaire was given to all faculty members who have been go through online teaching method due to corona pandemic. The questionnaire was made of various questions based on Personal, attitudinal and contextual barriers faced by faculty in online teaching. The data was allayed through SPSS version 20.0 and results were mentioned in the form of frequency and percentage, the Chi-Square test was applied and the level of significance was expressed as \(P < 0.05\).

**RESULTS**

The total 50 faculty members of both sexes were included. The frequency and percentage of gender of basic and clinical faculty members mentioned in table 1.

1. By designation of faculty members included lecturer, assistant professor, associate professor and professor included and their frequency is shown in figure 1.

**Table No.1: Showing Frequency and Percentage (%) of Gender distribution of faculty members’ participation in online courses**

<table>
<thead>
<tr>
<th>Gender</th>
<th>Basic Medical Sciences</th>
<th>Clinical Sciences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>13(52%)</td>
<td>11(44%)</td>
</tr>
<tr>
<td>Female</td>
<td>12(48%)</td>
<td>14(56%)</td>
</tr>
<tr>
<td>Total</td>
<td>25(100%)</td>
<td>25(100%)</td>
</tr>
</tbody>
</table>

The faculty of basic and clinical sciences was facing personal obstacles while conducting the online classes. Their results were mentioned in frequency and percentage is shown in table 2. The faculty of basic and clinical sciences was facing attitudinal and contextual obstacles while conducting the online classes. And results were mentioned in frequency and percentage is shown in table 3.

**Table No.2. Showing personal barriers for faculty members’ participation in online courses**

<table>
<thead>
<tr>
<th>Personal obstacles to faculty members’ participation in online education</th>
<th>Basic Medical Sciences</th>
<th>Clinical Sciences</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agree</td>
<td>Neutral</td>
<td>Disagree</td>
<td>Agree</td>
</tr>
<tr>
<td>1 Insufficient awareness about online teaching</td>
<td>11(44%)</td>
<td>4(16%)</td>
<td>10(40%)</td>
</tr>
<tr>
<td>2 Unawareness about online teaching environment</td>
<td>15(60%)</td>
<td>2(8%)</td>
<td>8(32%)</td>
</tr>
<tr>
<td>3 Insufficient knowledge about the planning of online course</td>
<td>13(52%)</td>
<td>1(4%)</td>
<td>11(44%)</td>
</tr>
<tr>
<td>4 Anxiety regarding excessive workload</td>
<td>16(64%)</td>
<td>3(12%)</td>
<td>6(24%)</td>
</tr>
<tr>
<td>5 Anxiety regarding insufficient time for other academic activities</td>
<td>17(68%)</td>
<td>2(8%)</td>
<td>6(24%)</td>
</tr>
<tr>
<td>6 Insufficient computer skills</td>
<td>13(52%)</td>
<td>2(8%)</td>
<td>10(40%)</td>
</tr>
<tr>
<td>7 Reluctant to learn an essential skills for online teaching</td>
<td>2(8%)</td>
<td>1(4%)</td>
<td>22(88%)</td>
</tr>
<tr>
<td>8 Reluctant to adopt the new educational technique</td>
<td>2(8%)</td>
<td>5(20%)</td>
<td>18(72%)</td>
</tr>
</tbody>
</table>
DISCUSSION

In this study it was revealed that many factors cause hindrances in online teaching. The outcomes observed in present study describe the peripheral circumstantial barriers that have been playing crucial role in online teaching system. This was really discouraging for the faculty members who have participate in online classes. They were facing problems due lack of tools like software, weak internet sources and electricity issues. Many faculty members due to insufficient skills of using computers faced difficulties. The inadequate activities of administrators concerning educators direction have been professed as the utmost projecting obstacles for faculty members becoming the part of online teaching. These findings were in accordance with the study done by an Iranian author who has noticed the external and internal contextual inhibitors faced during academic activities. Many challenges are also created for faculty in terms of infrastructure of technology. In present study it was noticed that insufficient knowledge regarding awareness of online teaching methodology as well its environment creates anxiety among faculty members of clinical as well basic side with the percentage of (60%) basic and clinical (64%). Another study also revealed that in developing countries these factors are more commonly seen. They have also mentioned that inadequate information of planning the course outline for online system increase the workload among faculty members. In present study it was also noticed that faculty of basic and clinical sciences were facing anxiety regarding online teaching because of direct proportional effect on quality of education that is due to lack of direct interaction with students. Its percentage was (62%) agreed basic (72%) clinical faculty. The recent study reported that in online session the healthy discussion declined, not only that but collaboration and weakness in responsiveness of all queries creates issues along with that cultural issues also noticed. Another study found the obstacles in Massive Open Online Courses in teaching and learning. This study also emphasizes on technology issues, how to organize the system, the motivation and internet sources. In comparison with this in current study it was observed that faculty was facing ambiguities regarding hardware and software equipment provided by the institute for the conduction of online course with percentage of (76%) basic and (68%) clinical. Several researches have recognized essential findings regarding electronic learning system. The management and analysis of critical success factors (CSFs) of electronic learning has also been established. That might help out in constructing the new policies of education and generating the electronic learning system effectively.

CONCLUSION

In present study it was noticed that high percentage of faculty was concerns regarding deficiencies of important equipment like software, internet sources) and inadequate information in online teaching. Thus to implement on new educational environment, need support and training regarding online teaching.

Author’s Contribution:
Concept & Design of Study: Asad Raza Jiskani
Drafting: Hina Khan, Umer Kazi
Data Analysis: Nighat Seema, Bushra Zulfiqar, Khalique-ur-

| Table No.3: Showing Attitudinal and Contextual barriers for faculty members’ participation in online courses |
|---|---|---|
| | Basic Medical Sciences | Clinical Sciences |
| Attitudinal and Contextual obstacles to faculty members’ participation in online education | Agree | Neutral | Disagree | Agree | Neutral | Disagree | P-Value |
| 9 | Anxiety regarding online teaching that might be effect the quality of an education | 18(72%) | 1(4%) | 6(24%) | 16(64%) | 2(8%) | 7(28%) | 0.768 |
| 10 | Anxiety regarding lacking of interaction between the students and facilitators during online course | 16(64%) | 3(12%) | 6(24%) | 18(72%) | 1(4%) | 6(24%) | 0.572 |
| 11 | Ambiguity about the quality of software provided by the institute | 19(76%) | 1(4%) | 5(20%) | 22(88%) | 1(4%) | 2(8%) | 0.471 |
| 12 | Anxiety about the loss of control over teaching | 13(52%) | 5(20%) | 7(28%) | 14(56%) | 4(16%) | 7(28%) | 0.929 |
| 13 | Ambiguity regarding hardware and software equipment provided by the institute for the conduction of online course | 19(76%) | 3(12%) | 3(12%) | 17(68%) | 4(16%) | 4(16%) | 0.820 |
| 14 | Ambiguity about the technical support during online course | 15(60%) | 5(20%) | 5(20%) | 16(64%) | 3(12%) | 6(24%) | 0.732 |
| 15 | Anxiety about the lacking of peer-collaboration during online teaching | 14(56%) | 4(16%) | 7(28%) | 16(64%) | 4(16%) | 5(20%) | 0.792 |
Revisiting Critically: Asad Raza Jiskani, Hina Khan, Umer Kazi

Conflict of Interest: The study has no conflict of interest to declare by any author.

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Diagnostic Precision Serum of Albumin Level and its Correlation with the Esophageal Varices Among Patients of Chronic Liver Disease

Raja Muhammad Adeel Khan¹, Muhammad Aslam Rind², Maria Nazir², Amjid Azam Sirewal⁴, Shahzad Shaikh³ and Sikandar-e-Azam Yousfani⁵

ABSTRACT

Objective: To determine the diagnostic precision of serum albumin as well as its correlation with the esophageal varices in different grades among patients of chronic liver disease.

Study Design: Cross sectional study

Place and Duration of Study: This study was conducted at the Department of Gastroenterology, Asian Institute of Medical Sciences (AIMS), Hyderabad. The study was carried out from February 2019 to July 2019.

Materials and Methods: Patients of age 25-60 years of either gender presented in outpatient department with history of chronic liver disease were included. Blood samples were collected for the analysis of serum albumin level while Endoscopy was performed for the confirmation and grading of esophageal varices. All information was collected using pre-tested questionnaire.

Results: Mean age of study participants was 49.87±12.58 years while majority 67.56% participants were male. Esophageal varices on serum albumin were found positive in 39 (41.1%) cases and EGD was found positive in 38.95% cases. The sensitivity of esophageal varices on serum albumin was 81.40%with specificity of 88.46%. The PPV value was 85.36%, NPV value was 85.18% and diagnostic accuracy of esophageal varices on serum albumin was 85.26%. A statistically significant correlation (p-value < 0.05) between serumalbumin level and esophageal varices in different grades among chronic liver disease patients was determined.

Conclusion: Serum albumin is a useful prognosticator of esophageal varices among patients of chronic hepatic disorder.

Key Words: Esophagogastroduodenoscopy, Esophageal Varices, Serum Albumin, Chronic Liver Disease.

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INTRODUCTION

Esophageal Varices (EV) are abnormally enflamed veins in the distal esophageal end. It occurs when the normal blood circulation towards the liver is obstructed due to a scarred tissue or clot formed within hepatic parenchyma

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The rupture of gastric varices (GV) causes variceal hemorrhage, a most fatal complication of cirrhosis. It has been demonstrated that >90% of cirrhotic patients develop GV out of which 30% may bleed. The prevalence of GV among cirrhotic subjects is projected from 60.0% to 80.0% depending on the etiology and severity of hepatic disorders. According to the recent gastroenterological guidelines, all patients with liver cirrhosis should undergo endoscopic examination for diagnosis of EVs. Furthermore, for identifying the high risk patients with possibilities of bleeding can be benefitted from primary prophylaxis. This method put extra burden on the endoscopy units as well as the recurrent testing gradually can possibly have a negative impact on patient’s compliance. Noninvasive detection of EVs cases at highest risk might limit exploration to those most likely to benefit. Upper gastrointestinal endoscopy is considered to be the benchmark against which all other assays are evaluated, however it has limitations. Hypoalbuminemia is reliable substitute indicator for the existence of EVs in Chronic liver disease (CLD) because of Hepatitis B and C viruses (HBV) and (HCV). It is reported that sensitivity and
specificity of serum albumin for detection of EV is 66% and 80% respectively. In agreement, a study reported the specificity and sensitivity of serum albumin level for detection of EV was 56% and 83.8% respectively. Another study reported that sensitivity and specificity of serum albumin level for detection of EV was 53.2% and 91% respectively. Literature reports that some non-invasive methods are available which can detect presence of EVs. But in routine, these procedures are not adopted and patients have to undergo Esophagogastroduodenoscopy (EGD). EGD is an invasive procedure which also has side effects and repeated EGD is also risk for poor prognosis of patients in such critical condition which may lead to more severe outcome. Through this study intended to appraise the diagnostic accuracy of serum-albumin level, so that in future we can implement the results of this study as earlier reported accuracy of serum albumin is variable in the different studies. In routine, in tertiary care hospitals, physicians rely on EGD but in sub-urban areas or at peripheries, facility of EGD is not available. So, this study will also help to rule out the problem of EVs just assessment through albumin level in case results show high diagnostic accuracy instead of referring patient to some tertiary care hospital which also have burden. This will also help to reduce burden of hospital by reducing number of referrals from peripheries.

MATERIALS AND METHODS

A cross sectional study was conducted at the department of Gastroenterology, Asian Institute of Medical Sciences (AIMS), Hyderabad. The study was carried out from February 2019 to July 2019. Sample size of 95 was determined with estimated percentage of esophageal varices i.e. 60% and taking sensitivity and specificity of serum albumin level i.e. 53.2% and 91% with 11% and 8% margin of error respectively in patients of CLD. Patients of age 25-60 years of either gender presented in outpatient department with history of chronic liver disease were included in the study. While those received band ligation for EVs, sclerotherapy and prophylactic therapy for portal hypertension or history of thrombosis of splenic or portal veins as well as those with hyposaluminemia due to congestive cardiac failure (EF<50% on echo), nephritic syndrome (24-hour urinary protein >3.5gm/dl) or underweight (BMI<19kg/m2) etc. were excluded.

Informed consent was taken from all the study patients. Blood specimens of 5cc were obtained and submitted to the laboratory of AIMS for the analysis of serum albumin level. Based on the albumin levels reports, all patients were categorized as negative or positive for esophageal varices (according to operational definition). Serum albumin level <3.4 g/dl was assessed as positive. EGD of all patients was then performed by expert and senior gastroenterologist for the confirmation and grading of esophageal varices by deFranchis classification’ system for the grading of Esophageal varices. According to the classification, Grade I means small straight varices, Grade 2 means: enlarged and tortuous varices occupying less than 1/3rd of the lumen while grade 3 means the coil-shaped large varices occupying more than 3/4th of the lumen. All information of patients and findings of EGD was recorded using a pre-tested semi-structured questionnaire while the data analysis was performed using SPSS version 22. For quantitative variables such as age and duration of CLD, mean±SD was calculated. Frequencies & percentages were computed for qualitative variables such as gender and presence of EVs on serum albumin and EGD. Sensitivity, Specificity, negative and positive predictive values (NPV & PPV) and diagnostic accuracy of serum albumin taking EGD as gold standard. Pearson correlation was also calculated for measuring the correlation between the levels of serum albumin with the esophageal varices in different grades. P-value <0.05 was considered as the level of significance.

RESULTS

Total 95 cases were participated and examined in the present study. The mean age of the study participants was 49.87+12.58 years with minimum 32 years and maximum 70 years of age. Majority 64 (67.36%) participants were male and 31(32.64%) patients were females (Table I)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean±SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>49.87±12.58</td>
</tr>
<tr>
<td>Duration of CLD (Months)</td>
<td>2.32±1.06</td>
</tr>
<tr>
<td>Serum Albumin level (g/dl)</td>
<td>3.65±0.82</td>
</tr>
</tbody>
</table>

Table 2 is demonstrating the frequency and percentage distribution of esophageal varices on serum albumin and EGD. (Table 2)

<table>
<thead>
<tr>
<th>Esophageal varices</th>
<th>Frequency</th>
<th>%age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serum Albumin</td>
<td>Positive</td>
<td>41</td>
</tr>
<tr>
<td></td>
<td>Negative</td>
<td>54</td>
</tr>
<tr>
<td>EGD</td>
<td>Present</td>
<td>43</td>
</tr>
<tr>
<td></td>
<td>Absent</td>
<td>52</td>
</tr>
</tbody>
</table>

*E: serum albumin <3.4 g/dl
Present study is designed to assessed the serum albumin (a potential noninvasive diagnostic marker) to predict the esophageal varices, and found serum albumin was a good forecaster for diagnosis of EVs. In this study mean age of the patients was 49.87±12.58 years with majority (67.36%) of them were male out of all cases. These findings are similar to the study of Kumar S. et al¹ as, out of all cases 62% were males and patients’ mean age was 44.6 ± 13.6 years. Kraja B et al¹² also found similar findings regarding age andgender.

In the present study the mean serum albumin level of the study participants was3.65±0.82 g/dl. These findings are consistent with the study byLaeeq SM et al⁸ as mean albumin level was 2.88±0.68 among cirrhotic patients presented with EVs. In another study of Khan et al⁹ 60.5% patients had low albumin level and severity of EVs was significantly correlated with low level of albumin. Ijaz N et al¹² also demonstrated a significant negative association between esophageal varices and low level of serum albumin among cirrhotic cases.

In our study the diagnosis of EV on serum albumin was found positive in 43.2% patients while on EGD it was found positive in 45.2% patients. The diagnostic accuracy of esophageal varices on serum albumin was recorded 85.26% taking esophageal varices on EGD as gold standard is demonstrated in Table 4.

Table No.3: Correlation between serum albumin level and grade of esophageal varices

<table>
<thead>
<tr>
<th>Albumin Level</th>
<th>Number of patient with different grading of E.Vs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Grade I</td>
</tr>
<tr>
<td>&lt;2.8 g/dl</td>
<td>10</td>
</tr>
<tr>
<td>2.8 to 3.3 g/dl</td>
<td>07</td>
</tr>
<tr>
<td>Total</td>
<td>17</td>
</tr>
<tr>
<td>r = -0.689</td>
<td>p-value &lt;0.05 (0.000)</td>
</tr>
</tbody>
</table>

The sensitivity, specificity, NPV and PPV of esophageal varices on serum albumin along with the diagnostic accuracy of esophageal varices on serum albumin taking esophageal varices on EGD as gold standard is demonstrated in Table 4.

Table No.4: Comparison of serum albumin with EGD for prediction of EVs

<table>
<thead>
<tr>
<th>Esophageal varices on serum albumin</th>
<th>EVs on EGD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Positive</td>
</tr>
<tr>
<td>Positive</td>
<td>35</td>
</tr>
<tr>
<td>Negative</td>
<td>8</td>
</tr>
<tr>
<td>Total</td>
<td>43</td>
</tr>
</tbody>
</table>

- Sensitivity 81.40%
- Specificity 88.46%
- PPV 85.36%
- NPV 85.18%

Diagnostic Accuracy 85.26%

DISCUSSION

Esophageal varices are one of the major complications of portal hypertension resulting due to chronic liver diseases. These can be prevented by detecting them in early stage and with the prompt prophylaxis.¹¹ EGD is the gold standard procedure for the detection as well as and treatment of esophageal varices. But due to its higher cost and lack proper skills of different clinicians it not only become problematic for patients but also increase the out of pocket expenditure.¹² Among the noninvasive parameters, serum albumin can play a vital role of proxy marker in early detection and development of esophageal varices among patients with compensated or chronic liver diseases.⁹

CONCLUSION

Serum albumin is a useful prognosticator of esophageal varices with high sensitivity as well as specificity among patients of chronic hepatic disorder.

Author’s Contribution:
Concept & Design of Study: Raja Muhammad Adeel Khan
Drafting: Muhammad Aslam Rind, Maria Nazir
Data Analysis: Amjid Azam Sirewal,
Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

Evaluation of Serum Lipid Profile in Preeclampsia and Healthy Pregnant Women, Mirpur AJK
Aurooj Fatima¹, Aisha Yousaf², Shakila Khadim³ and Asnad⁴

ABSTRACT

Objective: To evaluate Serum Lipid Profile in preeclampsia Patients and normal pregnant women in Mirpur, AJK.

Study Design: Cross-sectional study

Place and Duration of Study: This study was conducted at the Department of Obstetrics and Gynaecology and Biochemistry, Mohtarma Benazir Bhutto Shaheed Medical College Mirpur AJK from January 2018 to July 2019.

Materials and Methods: We take for study 200 Preeclampsia patients and 100 health pregnant women. We take blood samples from both groups women and analyzed the samples on Microlab 300 for serum lipid profile. (Cholestol, HDL, LDL, VLDL and Triglycride). For the study we use kits made of Merck Pvt. We also did other biochemistry test and hematological test.

Results: The result indicate that all the lipid profile (LDL, Triglycride) is higher except HDL in women with as compare to normal pregnant women. Total cholesterol (254.5 ± 12.8) mg/dl, LDL (128.9 ± 21.5) mg/dl, and Triglyceride (199.2 ± 32.5) mg/dl, in Preeclampsia patients are higher as compare to normal pregnant women. While HDL (40.77± 8.5) mg/dl, is decreased in Preeclampsia as compare to normal pregnant women.

Conclusion: The result of this study it is conclude that pregnant women should adopt balanced diet and reduced the lipid profile and reduced their weight and change their life style and adopt healthy life style.

Key Words: Preeclampsia, Lipid profile, normal pregnant


INTRODUCTION

In pregnancy, Preeclampsia mostly causing complication and also relate with morbidity and mortality of perinatal and maternal.¹ the worldwide percentage of Preeclampsia compilation is 7-10% of pregnancies.² The percentage of raised blood pressure is different among the pregnant women 20-25% is exist in chronic hypertension previous history of pregnant women, 10% of primi parous women and 5% of entire pregnancies.³ pregnancy-induced hypertension (PIH) risk is increasing with increasing age of women.¹ Dyslipidemia is also developing with pregnancy-induced hypertension.⁵ For cardiovascular disease, independent risk factors, are endothelial dysfunction and Insulin resistance ⁶. In preeclampsia, it is observed that abnormal lipid profile produced vascular dysfunction and also oxidative stress which caused preeclampsia.⁷ There is evidence is present t that increasing the lipid profile which ultimately caused preeclampsia. Especially when triglycerides and LDL (low-density lipoproteins) are increased in oxidized form in women.⁸ It is suggested that in pregnancy the estrogen synthesis is higher which increased the synthesis of triglyceride in liver and by hyperinsulinism it is modulated and this process is occurred in pregnancy which ultimately caused endothelial cell damage.⁹ In uterine spiral arteries, triglyceride and dense LDL particles are accumulate due to more or three to four time more triglycerides are synthesis and this caused endothelial cell damage.¹⁰ In this study we evaluate lipid profile preeclampsia patients and compared to normal pregnant women in Mirpur AJK.

MATERIALS AND METHODS

We take for study 200 Preeclampsia patients and 100 health pregnant women. The study was conducted in the department of Obstetrics and gynaecology and Biochemistry Department of Mohtarma Benazir Bhutto Shaheed Medical College Mirpur AJK. We take blood samples from both groups women and analyzed the samples on Microlab 300 for serum lipid profile. (Cholestol, HDL, LDL, VLDL and Triglycride). For
the study we use kits made of Merck Pvt. We also done other biochemistry test and hematological test.

RESULTS

The result indicates that all the lipid profile (LDL, Triglyceride) is higher except HDL in women with as compare to normal pregnant women. Total cholesterol (254.5 ± 12.8) mg/dl, LDL (128.9 ± 21.5) mg/dl, and Triglyceride (199.2 ± 32.5) mg/dl, in Preeclampsia are higher as compare to normal pregnant women. While HDL (40.77± 8.5) mg/dl, is decreased in Preeclampsia as compare to normal pregnant women. Table 1.

Table No.1: Biochemical profile of Preeclampsia patients and Normal pregnant women

<table>
<thead>
<tr>
<th>Lipid Profile</th>
<th>Preeclampsia Patients (n=200)</th>
<th>Normal pregnant women (n=100)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fasting Blood Glucose(mg/dl)</td>
<td>97.8 ± 4.3</td>
<td>99.4 ± 4.6</td>
</tr>
<tr>
<td>Total Cholesterol (mg/dl)</td>
<td>254.5 ± 12.8</td>
<td>192.6 ± 31.5</td>
</tr>
<tr>
<td>LDL (mg/dl)</td>
<td>128.9 ± 21.5</td>
<td>114.5± 18.3</td>
</tr>
<tr>
<td>HDL (mg/dl)</td>
<td>40.77± 8.5</td>
<td>57.3 ± 9.1</td>
</tr>
<tr>
<td>Triglycerides (mg/dl)</td>
<td>199.2 ± 32.5</td>
<td>133.3 ± 31.2</td>
</tr>
</tbody>
</table>

DISCUSSION

In the study of Anjum there is high lipid profile in pregnant women as compare to normotensive women and it also observed that HDL is significantly low in pregnant women as compare to normotensive women. We take for study 200 Preeclampsia patients and 100 health pregnant women. The study was conducted in the department of Obstetrics and gynaecology and Biochemistry Department of Mohtarma Benazir Bhutto Shaheed Medical College Mirpur AJk. We take blood samples from both groups women and analyzed the samples on Microlab 300 for serum lipid profile. (Cholesterol, HDL, LDL, VLDL and Triglyceride). For the study we use kits made of Merck Pvt. We also done other biochemistry test and hematological test.

In pregnancy, endothelial dysfunction occurred it is due increased synthesis of triglyceride in liver it is conclude by Mikhail et al. In the study of Gohil et al., it is described that HDL is significantly decreases in preeclampsia as compared to non-pregnant while the other profile of lipid (Triglycerides, VLDL and LDL) is increased. In pregnancy, Preeclampsia mostly causing complication also relate with morbidity and mortality of perinatal and maternal. the worldwide percentage of Preeclampsia compilation is 7-10% of pregnancies.

The percentage of raised blood pressure is differ among the pregnant women 20-25% is exist in chronic hypertension previous history of pregnant women, 10% of primi parous women and 5% of entire pregnancies.

Data Analysis:

Drafting: Aurooj Fatima
Revisiting Critically: Shakila Khadm, Asnad
Final Approval of version: Aurooj Fatima

CONCLUSION

The result of this study it is conclude that pregnant women should adopt balanced diet and reduced the lipid profile and reduced their weight and change their life style and adopt healthy life style.

Author’s Contribution:

Concept & Design of Study: Aurooj Fatima
Data Analysis: Shakila Khadm, Asnad
Revisiting Critically: Aurooj Fatima

July, 2020
Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

Morbidity Related to Incisional Hernia Repair with Abdominoplasty
Sajid Hussain, Farhan Malik and Fatima Zulfiqar

ABSTRACT

Objective: To find out the morbidity while repairing incisional hernia with abdominoplasty and comparing it with incisional hernia repair alone.

Study Design: randomized prospective study

Place and Duration of Study: This study was conducted at the Surgical Unit of Allama Iqbal Memorial Teaching Hospital Sialkot from Jan 2015 to Dec 2019.

Materials and Methods: A total of 50 cases were randomized prospectively to compare the repair of incisional hernia isolated/combined with abdominoplasty. This is randomized prospective studies which is comparing two groups of patients, one small incisional hernia repair and second one repair of incisional hernia with abdominoplasty, in the general surgical unit of a teaching hospital.

Results: The incidences were more in female as compared to male, significant relationship found between two groups regard to BMI (33.28 vs 34.96) (p 0.002), number of operation (p 0.001), defect size (p 0.001), mean hospital stay (p 0.001), insignificant relation found in regard to gender, residence, complications and recurrence (p-value>0.05).

Conclusion: Post incisional hernia repair is still a challenge for surgeon to combine the two procedures to improve the quality of life with low morbidity and recurrences in well selected patients.

Key Words: Incisional Hernia, Meshoplasty, Abdominoplasty, Seroma, Recurrence

Citation of article: Hussain S, Malik F, Zulfiqar F. Morbidity Related to Incisional Hernia Repair with Abdominoplasty. Med Forum 2020;31(7):71-73.

INTRODUCTION

Tummy Tuck is an aesthetic surgery to remove excessive protruded skin and fat by a plastic surgery carrying high morbidity\(^1 \)\(^2 \), the purpose of removal of excessive skin to tighten the laxity of abdominal wall musculature thus creating an umbilicus and leaving behind a minimal scarring. With the social awareness and morbidity associated with the obesity, few patients insist their physician for their removal of the skin fat in one sitting, forcing their physician to combine performing hernioplasty and abdominoplasty\(^4 \)\(^6 \).

So, there is rise in the incidence of the complications postoperatively which may be immediate but life-threatening complications like deep vein thrombosis, pulmonary embolism\(^12 \) and complications like hematoma, seroma, wound necrosis, wound dehiscence may occur within weeks\(^13 \) and complications like scar hypertrophy and nerve entrapment may appear after few months\(^14 \).

So, the main objective of our study was to find out the morbidity associated with tummy tuck while repairing the incisional hernia and comparing it to incisional hernia repair alone for improvement in their quality of life.

MATERIALS AND METHODS

This is randomized prospective studies which is comparing two groups of patients, one small incisional hernia repair and second one repair of incisional hernia with abdominoplasty, in the general surgical unit of a teaching hospital.

Inclusion criteria: This study includes patients above 40 years of age with no co - morbidity like hepatic, renal, cardiac, pulmonary disease and bleeding disorders. The conformation of the group/defect within 5 to 10 cm seen through abdominal ultrasonography or CT scan abdomen and this is located between umbilicus and pubic symphsis.

Exclusion criteria: Defects smaller or greater than 5 to 10cm, the patients with signs and symptoms of strangulation, the patients below the age of 40 and with comorbidity like tuberculous abdomen, intestinal neoplasia and other autoimmune diseases. Selection of the patients was recognized on the day of operation with blinding divided into incisional hernia repair group and incisional hernia with abdominoplasty, the data was collected and which was analyzed later.

Data analysis: Descriptive statistics were characterized in the form of means, (standard deviations) frequency
RESULTS

The majority of the patients were female (18/25(72%) in group A, 15/25(60%) in group B) and the mean age of the two groups was not having any difference (54.6yrs group A, 51.8yrs in group B). The BMI of the group with abdominoplasty (33.28 group B) was higher than the group without abdominoplasty (34.96 group A). The 45(90%) patients belonged to urban area as compared to 5(10%) patients belonged to rural areas, the most involved sites were the medial site in 35(70%) patients as compared to 15(30%) patients on lateral sites of previous operations, the defect size which was assessed on CT scan or on ultrasonography between pubic symphysis and umbilicus (7.32cm vs 11.36cm respectively). These patients were also assessed postoperatively regarding their mean hospital stay which was slightly more in abdominoplasty case as compared to isolated hernioplasty while post-operative complications like wound necrosis, seroma, hypertrophic scar were more in abdominoplasty than just pain in isolated hernioplasty.

Table No.1: Age and sex

<table>
<thead>
<tr>
<th>Age (Years)</th>
<th>Hernia Repair Without Abdominoplasty (n=25)</th>
<th>Hernia Repair With Abdominoplasty (n=25)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>54.60±12.39</td>
<td>51.88±11.91</td>
<td>0.433</td>
<td></td>
</tr>
<tr>
<td>BMI (Kg/m²)</td>
<td>33.28±1.9</td>
<td>34.96±1.64</td>
<td>0.002</td>
</tr>
<tr>
<td>Number of Operations One Two Three</td>
<td>24 (100) 0 (0) 1 (14.3)</td>
<td>0 (0) 19 (100) 06 (85.7)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Sex Male Female</td>
<td>08 (57.1) 17 (47.2)</td>
<td>06 (42.9) 19 (52.8)</td>
<td>0.529</td>
</tr>
<tr>
<td>Residence Urban Rural</td>
<td>24 (53.3) 01 (20)</td>
<td>21 (46.7) 04 (80)</td>
<td>0.349</td>
</tr>
<tr>
<td>Location Medial Lateral</td>
<td>19 (54.3) 06 (40)</td>
<td>16 (45.7) 09 (60)</td>
<td>0.355</td>
</tr>
<tr>
<td>Defect Size</td>
<td>7.32±1.97</td>
<td>11.36±1.60</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Table No.2: Mean Hospital Stay

<table>
<thead>
<tr>
<th>Hernia Repair Without Abdominoplasty (n=25)</th>
<th>Hernia Repair With Abdominoplasty (n=25)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Hospital Stay (Days)</td>
<td>43.56±4.05</td>
<td>68.72±5.38</td>
</tr>
<tr>
<td>Complications None Pain Necrosis Seroma Scar</td>
<td>17 (51.5) 5 (50) 0 (0) 0 (0) 3 (100)</td>
<td>16 (48.5) 5 (50) 01 (100) 03 (100) 0 (0)</td>
</tr>
<tr>
<td>Recurrence Yes No</td>
<td>03 (50) 22 (50)</td>
<td>03 (50) 22 (50)</td>
</tr>
</tbody>
</table>

DISCUSSION

This study was carried out in order to compare the results of the repair of incisional hernia with and without abdominoplasty, to see the demographic and clinical difference pre-operatively and post-operatively which have already been studied in various other studies with same conclusions. The repair of the incisional hernia is a challenge both for the surgeons and the society. However, it may coexist with diovation thus producing a lot of stretching force on the skin leading to demand of the abdominoplasty in these patients. These constructions are not so simple to decide and implement thus require careful monitoring preoperatively and needs close work up before making any decision if correction is to be advised.

The mean age which was found in the repair of the incisional hernia with and without abdominoplasty is inconsistent with other studies carried out in this context. The cases were found more in the female as compared to the male while comparing the results in both groups. The most of these patients were belonging to the urban areas both groups with and without hernioplasty due to their life style, socioeconomic status and obesity, acquired as a result of hoteling, high caloric food consumption and sedentary life styles. Therefore, BMI of both groups were also compared which was found to be very high in the patients with repaired hernia with abdominoplasty as compared to those patients in which repair was done without abdominoplasty. This study was in consistent with the study done in other researches. Similarly, there was a great debate regarding the defect size between these two groups but the results were satisfactory and encouraging in both groups. Likewise, no difference was found at the actual site of the operation as the mid line/para median incisions got more herniation as compared to the lateral site of involvement. The post-operative complications like pain and nerve entrapment with sensory loss was also...
found in both groups which was not consistent with the study of the Von Sperling\(^2\). While the presence of the seroma and tissue necrosis were common in the group of repair of incisional hernia with abdominoplasty so we have found very low rate of post-operative complications in our study while others have reported seroma to occur in 4.7% to 7.14% in cases of full repair with abdominoplasty\(^2\). Very few cases of recurrence have been reported in both groups in our study, as compared to the recurrence rate as researched by other researchers like recurrence rate 49% with open repair of incisional hernia\(^2\). All the patients of group were followed in outdoor and they have been found very much satisfied with regard to their surgical procedures in respect to their quality of improvement in their life, satisfaction and self-esteem\(^2\).

CONCLUSION

Incisional hernia repair is still a challenge for surgeons to combine the two procedures safely with considerable improvement in the quality of life, low morbidity and recurrence so thus conveying message for surgeons to recommend a simultaneous repair with Tummy Tuck in a well selected patient.

Author’s Contribution:

Concept & Design of Study: Sajid Hussain
Drafting: Fatima Zulfiqar
Data Analysis: Farhan Malik
Revisiting Critically: Fatima Zulfiqar
Final Approval of version: Sajid Hussain

Conflict of Interest: The study has no conflict of interest to declare by any author.

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To Assess the Functional Outcome of AO/ASIF A3 Distal Femoral Fractures Fixed by Contour Locking Plate as Fixator Internee

Muhammad Khalid Syed, Muhammad Iqbal, Attaullah, Shahzad Nadeem Azhar, Tauseef Ahmed Baluch and Sadia Amin

ABSTRACT

Objective: To evaluate the radiological and functional outcome of Association for Osteosynthesis (AO)/Association for study of Internal Fixation (ASIF) A3 of distal femoral fractures treated with contour locking plates as fixator internee.

Study Design: Descriptive case series study.

Place and Duration of Study: This study was conducted at the Mayo hospital Lahore from February 2018 to August 2019.

Materials and Methods: Patients with close intra articular comminuted distal femoral fractures are admitted and operated with distal femoral contour locking plates by fixator internee principle. Follow up visit were planned as, after 4th week, 6th week and then monthly for 08 months. Radiological union was noted and functional evaluation was done by using the modified Mize outcome criteria and which was graded 1 as excellent, 2 as good, 3 as fair and 4 as failure.

Results: 16 patients with mean age 40.43 years of age were operated. Male patients were 10 (62.5%) while female 6 (37.5%). Patients were assessed with modified Mize criteria and excellent in 7 (43.75%), good in 4, (25%), Fair in 3 (18.7%) and failure in 2, (12.5%) patients. No implants failure was noted. No nonunion was noted. Bone grafting (bone marrow aspiration) was done in 5 cases.

Conclusion: When locking plate is applied as fixator internee, in intra articular comminuted fractures showed an excellent and good results radiological and functional results in AO/ASIFA3 complicated fractures in majority of the patients.

Key Words: AO/ASIF, A3, Fixator internee, Distal femoral fracture, contour locking plate.

INTRODUCTION

From all femur fractures about 6% fractures are distal femur fractures. These fractures are common in both male and females. Road traffic accidents, fall from a height and trauma during playing are the main reason of fractures in young adult’s males. Usually the age limit is between 20 to 45 years. These fractures are very common in aged female usually obeo 60 years of age. Their bone is osteoporotic and minor insult leads to the fractures.

These fractures are always very complex and problematic for treating surgeon. These fractures not only have comminution and but also have intra articular extension.

There are always complex soft tissues injuries around the knee joint. Sometimes quadriceps injury further add fire to fuel the problems. These fractures are fixed by deferent implants. Every implant has its advantages and disadvantages. Commonly used implants are angle blade plate, and dynamic condylar screw. Sometimes intramedullary nails are used. External fixator may be used in some cases and some surgeon advocates early primary arthroplasty.

The commonly used implant are failed due to the nature of bone and injury. The bone at this area is very osteoporotic and there is much comminution with intra articular extension. Some surgeon advocates the use of retrograde nailing. These nail have the drawbacks of arthrotomy. Sometimes nail protrudes into the knee joint. Knee stiffness is very common complication of these procedures. Now a day most commonly use implant is distal femur locking plate. These plates have many biomechanical advantages.
biomechanical advantages the chances of implant failure are minimum at the same time the chances of implant failure in case of angled blade plate and retrograde nailing are maximum. Locking plates need much energy before they failed\(^9,10\). Locking plates can be easily use as bridge plate The comminution area is bridged and screws are used to fix the fractures. By this way it acts like an internal fixator. This implant is a gold standard in osteoporotic fractures\(^11\). Due to the biomechanical advantages resistance to plate pull out is equal to the sum of all locking screws resistance in case of locking plate. The most common complication reported in conventional plate and screws is collapse of the fracture in Varus position. This complication is prevented by The multiple fixed angle locking screws in locking plate.\(^12\)

**MATERIALS AND METHODS**

This descriptive case series was conducted at Mayo Hospital Lahore from February 2018 to August 2019. All the patients with age between 16 to 50 years of either gender having AO/ASIF A3 supracondylar fractures were included in this study. The patients having pathological fracture polytrauma or evidence of osteomyelitis were excluded from the study. Modified Mize outcome Criteria was used to assess the outcome. Total 16 patients were included in the study. Patients were admitted throughout patients and emergency department. After admission routine investigations are done .X-rays of respective joint in AP and Lateral views are done in all cases. 3D CT scan was done as a routine Skin traction was applied in all patients. After test dose parenteral antibiotics were started. Informed written consent was mandatory in all cases. During history and examination, special attention was given to the soft tissues and neuro vascular status. All fractures were operated on next few days. Through later approach, two skin incision marked at the thigh under image intensifier, one distal and second proximal to the fracture site. We open the knee joint and make hole on the extensor expansion without opening the fracture hematoma. We slid the contour plate to proximal end of the fracture in between a plane bone and fascia lata. we used long plates. we made sure that proximal site of the distal screw should be at least 6 to 8 cm away from the fracture site. Under image intensifier, distal site of plate is fixed by one screw but screw did not lock., Then traction applied by an assistant in somewhat flexation position of knee. Care was taken to prevent sagging at the fracture site. Fracture geometry, length and rotation checked. Now proximal site of the fracture was opened Here plate is on or in the vastus lateralis muscle not on the bone, so there was a gap between the bone and plate .Now skin incision is made, fascia incised, patate identified ,two bone holder applies one near and second away from fracture site ,holding the bone and muscle. By maintaining the traction one screw near the fracture and second away from the fracture applied. Screw is applied as, make a drill hole using sleeve, screw size measured, size is measured crossing plate muscle and bone. While fixing the screw, when the screws cross the bone, one artery forces is placed under the plate to stop the plate to push forward during locking. By this method plate will not sit on the bone but stay in the muscle mass showing a gap between the plate and bone . This is a GOLDEN key of this article. All screws then were locked. At least 5 to 6 screws should be at proximal fracture site and 4 to 6 at distal knee joint In case of open fracture (Now converted in close fracture) about 30 t0 50cc bone marrow aspiration was taken from iliac crest and injected in the fracture site especially on the medial site of the fracture because this site is notorious for delay union or even nonunion. After putting suction drain wounds were closed in layers. Isosmotic knee and hip exercises were started whiten few days postoperatively. Intravenous antibiotic was started. We used available antibiotics in the hospital. After 24 hours’ drains were removed. Next day x-rays were done. Stitches were removed after 14 days as a policy. Follow up visits were planed after 4th, 6th, and after 8th weeks. Patients were called after every month. After 8th moth final follows up was completed and study closed. Radiological and functional outcome was evaluated through modified Mize outcome criteria\(^17\) and graded as excellent, good, fair and failure

Statistical analysis was done by using SPSS version 20. Categorical variables like fracture type and gender was represented as frequency and percentage while mean SD was calculated for numerical variables like age.

**Modified Mize outcome Criteria**

<table>
<thead>
<tr>
<th>Excellent</th>
<th>All of the following: loss of flexion &lt;10(^\circ); full extension no varus, valgus, or rotatory deformity no pain perfect joint congruency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td>No more than any 1 of the following: loss of flexion &gt;20(^\circ) loss of extension &gt;10(^\circ) Varus deformity &gt;5(^\circ) valgus deformity &gt;10(^\circ) minimum pain</td>
</tr>
<tr>
<td>Fair</td>
<td>Any 2 of the criteria listed in the previous Category</td>
</tr>
<tr>
<td>Failure</td>
<td>Any of the following: flexion ≤90(^\circ) Varus deformity &gt;10(^\circ) valgus deformity &gt;15(^\circ) joint in congruency disabling pain, irrespective of radiographic appearance</td>
</tr>
</tbody>
</table>
RESULTS

Total 16 patients were included in the study. Male were 10 (62.5%) and female were 6 (37.5%). The age range was from 20 to 50 years of age and Mean age was calculated as 33.6±10.14 years of age. The average follow up was about 39.49 weeks. Mean time of union was 19.8±4.13weeks. In 10 (62.5%) patients fractures were involved on right side, while in 6 (37.5%) patient’s fractures were on left side. 5 (31.5%) patients have road traffic accidents, 4 (25%) patients have a fall and 7 (43.75%) patients received fire arm injuries. 9 (56.25%) patients were with closed fractures and 7 (43.75%) patients were of grade 1 open fracture. 10 (62.5%) patients were given spinal anesthesia and 6 (37.5%) patients received general anesthesia. 40 minutes was average operating time with a range from 30 to 60 minutes (range 30-60 minutes). 8 days was mean hospital stay time and this time of hospital stay was range from 4 to 15 days. (range 4 to 15 days). 16.3 weeks were average union time of fractures and it range from 12.2 to 24.5 weeks (range 12.2 to 24.5 weeks). In 5 (31.25%) patients bone grafting was done through bone marrow aspiration.

7 (43.75%) patients achieved excellent results, 4 (25%) patients received good results, 3 (18.75%) patients received fair results and 2 (12.5%) patients received poor results as assessed with modified Mize outcome criteria. In 3 (18.75%) patients’ superficial infection was noted and in 1 (6.25%) patient deep infection was noted. Superficial infection was treated with antibiotics and deep infection was resolved after removal of implant. Implant removal was done after union. Limb shortening was not noted in any case. There was no any mal union and nonunion. All implant was stable through the study so there was no implant failure. Hospital mortality was not reported of any case.

In 4 (25%) patients’ removal of implant was done. The main reason of implant removal was deep infection in one patient and pain in 2 patients. In one patient implant removal was done on request. Re-fraction was not reported after implant removal up to 3 month. 7 months was mean follow up time and it range from 6 to 8 month (range 6 to 9 months).

DISCUSSION

7 (43.75%) patients got excellent result, 4 (25%) patients got good result, 3 (18.75%) patients got fair and results achieved in 2 (12.5%) patients were failure. Gupta18 reported in 34 (85%) patient’s excellent results, 4 (10%) patients’ good results and in 2 (5%) patients result was failure. Distal femoral locking plates were used for the treatment of condylar fractures in all patients.

He reported in 8 (32%) patients’ excellent results found, in 8 (32%) patients’ results were satisfactory, in 3 (12%) patients’ results were unsatisfactory and in 6 (24%) patients he reported failure results. Trivedi4 used locking plates in his study for treatment of AO type fractures in 25 patients.

Rajaiah3 reported in 7 (35%) patient results were excellent, good outcome in (40%) patients’ results were good fair in 4 (20%) results were fair and in 1 (5%) patients’ poor outcome was reported, when he used a distal locking plates while treating 20 patients’ Saini19 and colleagues did much work on distal femur fractures with distal locking plates and reported in 21 (62%) excellent results were found, in 11 (32%) patients satisfactory results were found and in 2 (6%) patients unsatisfactory results were found. Neer scoring system was used in their study for functional assessment while we used Modified Mize outcome Criteria.

We reported in 3 (18.75%) patients’ superficial infection and in 1 (6.25%) patients’ deep infection was found. Patient with Gustilo Anderson type I fracture had deep infection one patient with Type I fracture also got superficial infection. Close fractures were found in other 2 patients with close superficial infection.

Rajaiah3 2 (10%) patients were found to be infected, Trivedi4 found infection in his 2 (8%) and Poole5 infection to be present in his 2 (2%) patients.

In our study we did not find Nonunion in literature Reddy2 2 (3.3%) patients got nonunion, Trivedi4 reported nonunion in his 1 (4%) patient, Poole5 found infection in his 4 (3%) patients and Toro20 reported rate was about 2 (6.6%) in his cases. Toro and colleagues found 1 (8.3%) patient got implant failure. In their study Short plates with inadequate number of screws were responsible for implants failure. Ricci21 reported that after working on 335 distal femur fractures which he treated with locking plate and nonunion were found in his 64 (19.1%) patients. He documented that many problems from patients are very important in failure rate. Diabetes, smoking, obesity, open fractures and inadequate length of plate are main factors for failure of fixation.

Rodriguez et al22 had the same opinion as Ricci and 9.8% infection rate was reported in total 283 patients with distal femoral fractures. In their nonunion he reported the main factors involved were infection, obesity, open fracture and stainless-steel plates Another pointed out that nonunion was found in his 41% patients with stainless steel plates he used and is about 10% when he used titanium locking plates.

Henderson8 also pointed out that after reviewing 23 articles and reported that in (0% to 32%) patients’ complication of healing was noted, in 0% to 15% patients delayed union were noted and in 0% to 19%
patients nonunion were reported and in 0% to 20% implant failure was found. Poole\textsuperscript{5}. reported very high mortality rate after working 12 months. Relatively higher mean age (72.8 years) was the main reason of this problem. Stainless steel locking plate and titanium plates are not compared in our study. The following factor are not discussed in our study like obesity, diabetes, smoking, plate length and other possible risk factors for infection, non-union and implant failure. On large scale randomized trials should be conducted to address these issues.

**CONCLUSION**

We recommend that in comminuted extra articular fractures of distal femur fixator internee with locking plate is best option.

**Author's Contribution:**

- **Concept & Design of Study:** Muhammad Khalid Syed
- **Drafting:** Muhammad Iqbal, Attaullah
- **Data Analysis:** Shahzad Nadeem Azhar, Tauseef Ahmed Baluch, Sadia Amin
- **Revisiting Critically:** Muhammad Khalid, Syed, Muhammad Iqbal
- **Final Approval of version:** Muhammad Khalid Syed

**Conflict of Interest:** The study has no conflict of interest to declare by any author.

**REFERENCES**


To Evaluate the Outcome of Capsuloligamentaxis and Percutaneous Fixation of Schatzkar’s Type V and VI Tibial Condyle Fractures by Multiple K-Wires

Muhammad Iqbal, Tauseef Ahmed Baluch, Muhammad Khalid Syed, Shahzad Nadeem Azhar, Attaullah and Sumbale Arif

ABSTRACT

Objective: To evaluate the results when we are using percutaneous K-wires with pop cast in Schatzkar’s type V and type VI fractures under image intensifier under traction. Our hypothesis is by this method we can achieved good results with minimum complication.

Study Design: Descriptive case series study.

Place and Duration of Study: This study was conducted at the Mayo hospital Lahore from February 2018 to March 2019.

Materials and Methods: Total patients were 14 with 10 males and 4 were females. 31.4 years was the mean age of all patients and it ranges between 29 to 50 years. Schatzkar’s type V and VI fractures were fixed by multiples per cutaneous closed K-wires and pop cast applied.

Results: Union occurred in all fractures. The follow up was of 24 weeks and range was from 19 to 31 weeks. Average flexion was of 115 degrees and the range was between 90 to 125 degree of the patients, the extension lag was about 5 to 10 degree in three patients. Full weigh bearing started after 15 weeks and the range of weigh bearing was from 12 to 24 weeks in all patients. there was no remarkable complication in the study. All data about pain, range of motion, flexion contracture and extension lag, valgus and Varus alignment and stability was collected. The final assessment was done with the help of KSS (Knee Society Score) criteria [16,17]. Excellent (KSS > 80) were in 4(28.57%), good (KSS 70-79) were in 5 (35.71%), fair (KSS 60-69) were in 3 (21.42%) and poor (KSS < 60) were noted in 1 (7.14%) patient.

Conclusion: Fixation of fracture Percutaneously by multiple wires is treatment of choice in Schatzkar’s type V and VI with union, good range of motion and without any remarkable complication.

Key Words: Schatzkar’s type V and VI, multiple K-wires, pop cast, percutaneous

INTRODUCTION

Fractures of upper end tibia are nearly 1% of all tibia fractures. The forces responsible of injury are axil, Varus and valgus.1 The main force is usually in axil direction. The geometry of fractures is variable according to the direction of force and the position of knee joint.

This may be displaced or depressed. Fractures may be in medial condyle, lateral condyle or in both condyles. The fractures may be involved the metaphysis. Sometimes neuro vascular complication is associated with the fractures Schatzker classification is used for upper tibia fractures. It classifies then in 6 types. Type V and VI is associated are very notorious for complications. Type V is involved both condyles fractures and type VI is involved both condyles and metaphysis area. Most common complication associated with these fractures are compartment syndrome, neurovascular injuries, infection, and wound problems after surgeries.2 Anatomical reduction, stable fixation and soft tissues healing are mandatory for early rehabilitation programmed and also preventing of knee joint to early osteoarthritis3,4. The good results can only be achieved when you are aware of the following basic knowledge of, age of the patient, mechanism of injury, soft tissue injuries bony injuries and also any nerve and vessel injuries before surgery, the ‘gold standard’ ‘treatment of these complicated fractures are open

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reduction and fixation with double plates so patients can take part in early rehabilitation programmed to prevent joint stiffness but by using these implants are very notorious for wound complication. When minimum invasive methods are used with the use of arthroscope one can achieve a good result. Good results are being achieved by the use of external fixators. The fixators may be uniplanar or by planer or multi planer but complicated fractures are being treated well. The soft tissues covering the bone is very sensitive of this area. Usually soft tissues injury of both condyle fracture is very notorious for bad results so a very scientist approach is mandatory when treating these fractures of proximal tibia otherwise the ends results of these fractures are very disappointing for the surgeon.

**MATERIALS AND METHODS**

This descriptive case series was conducted at Mayo Hospital Lahore from February 2018 to March 2019. Patients of either gender and age ranged from 20 to 50 years with Schatzker type V and VI fracture were included in this study. While the patients having pathological fracture, open fracture and polytrauma were excluded from the study. Total 14 patients were included in the study. All patients were admitted from accident and emergency department and outpatient department Mayo hospital Lahore.

**Approach:** A skin traction is used for traction and counter traction because a bony traction produce a open fracture near the operative field. Elevation is done with B. Bowlar frame in 45 degree hip and knee position. When required further elevation is used. Injection 2 sum 2gram started intra venous before surgery. The condition of swelling, any blister formation and neurovascular stasis are monitor daily for at least two times a day till the operation decided All necessary investigations are done before operation. Necessary x-rays and CT- scan are mandatory in all cases. When acute symptoms subsided plain for surgery is decided

**Procedure:** All patients are operated usually under spinal anesthesia. All patients are put on traction table. We usually use tourniquet. After under traction capsuloligamentous was done and fractures geometry is noted under image intensifier in AP and Lateral Views by using an appropriate widow on the anteriomedial surface of tibia at fractures site, depressed fragments of bone are elevated. By this way all the articular surface is maintained and then bone grafting is done through the same window. The bone graft is take from the respective iliac crest. 3mm size K-wires are inserted at least 1.5 cm below the joint surface, one K-wire is passed from posteromedial to the anterolateral direction; then the 2nd K-wire is passed from posterolateral to the anteromedial aspect and then at least 20 K-wires are passed from lateral to medial aspect under the articular surfaces from anterior to posterior direction. Then two K-wires of 3mm of diameter are passed from medial cortex of tibia condyle to the lateral cortex of the tibia shaft crossing the fracture. So now there are total 7 wires, 3 below the articular surface and 4wires crossing each other and also crossing the medial and lateral cortexes. All wires are buried under the skin. Now well molded pop cast was applied from the thigh to near the ankle while patient is under the traction, Patient is kept on the traction till the pop cast dried. When pop dried patient is removed from the traction and pop is completed up to the toe of the foot. A long window is usually made anterior of pop cast if required.

**Follow up:** Isometric exercises were started as the patients feel better usually on 2nd post-operative day. After 2 weeks’ pop completed. After one-month post operatively pop was removed and new pop cast applied with turn buckle. Now patient was encouraged to flex and extend the knee joint with the help of turn buckle for one month. Then after two-month post operatively pop with turn buckle was removed and KAFO with hinge braces at knee joint was applied a patient is encouraged for partial weigh bearing with crutch for one month and at the same time movements at knee joint was kept on going up to maximum range. Routine x-ray is done after every 4 weeks. Full weight-bearing in started when union is noted on x-ray. Usually it takes 3 to 4 months’ post operatively

**RESULTS**

Total patients were 14. Males were 10 males and females were 4. The means age of the patients were 31.4 years (range;20 to 50). In our study 9(64.28%) cases were male and rest of 5(35.71%) cases were females. Left knee was injured in 6 (42.58%) patients and remaining 8(57.14%) patients were involved on the right knee. The mean age of the patient noticed was 31.4 years (range 20-50 years). 8(57.14%) patients were suffered road traffic accidents while 2(14.28%) patients were pedestrian and hit by motor bike, 3(21.42%) patients were injured when they fall from a height and 1(7.14%) patient suffered when he was playing hockey. In 2 (14.26%) patients, one got other minor hand injuries and second head injury.

Soft tissue complications were noted almost in all cases. The complications may be bruising, swelling and blister formation 8 (57.14%) patients and suspected compartment syndrome is noted in 1 (7.14%) patient.

Bone marrow aspiration taking from iliac crest and applied in fracture sit in 5(35.71%) cases as outpatient cases in operation theater under local anthesitha.

The patients were remained admitted in the ward from 1 to 12 days before operation and the mean duration was 6 days. No any kind of complications were found during the operation. All patients were discharged from the ward from 2 to 14 days without any post-operative complications and the mean postoperative time of discharge range was 2-14 days. The follow up was done from 18 to 32 weeks and the means follow up was
The range was noted from 90 degrees to the about 125 degrees. 3 patients (15%) have an extension lag from 5 degrees to 10 degrees this was remained till our last follow up period. The all patients started full weigh bearing from 12 weeks to 24 weeks post operatively and the mean weigh bearing time was about 15 weeks. All data about pain, range of motion flexion contractures, extension lag stability and Varus and valgus angle was collected. The final result was collected and outcome was assessed by comparing the the KSS (Knee Society Score) criteria'.

In 4(28.57%) patients’ excellent results were (KSS > 80) seen, in 5 (35.71%) patients’ good results (KSS 70-79) were seen, in 3(21.42%) patients fair (KSS 60-69) result were seen, and in remaining 1 (7.14%) patient poor (KSS < 60) result were found. Pin tract infections was noticed in 2 (14.28%) patients and infection was treated by oral antibiotics. Foot drop was noticed in 1(7.14%) patient. This foot drop was recovered after the 6 weeks. The systemic complications and infections did not found in any patient. Soft tissue problems, wound breakdown, and functional impairment were not reported.

**DISCUSSION**

A good results depends on the articular surface restoration, and maintained of the biology. A stable pain free properly aligned joint is the end result of a good surgery. Although a operation with Open reduction and internal fixation was usually think to be good method for a stable joint. By this method usually a good joint shape is obtained but there are a lot of risk of soft tissue insult. This insult result in wound complication and infection.

It was noted that all the condyle fractures are not properly reduced by ligamentotaxis and we have to open the joint, sometimes in case of reduction of the articular surface of the joint.

The following options are mandatory in case of a tibia condyle fracture i.e., damage to soft t issues with articular cartilage, fracture reduction, joint stability, fixation stability, and limb alignment. We are operated schazker’s type V and type VI fracture which are considered to be high –energy fractured. and usually low –energy fractures are discussed as compare to these high energy fractures.

The condition of soft-tissue insult was also considering a very important role in final outcome. The original surgical technique was based on single anterior incision, opening the both sides of the joint. This severe soft-tissue stripping was the main reason of devascularization with end result of infection. Infection rates can be minimized if we use less invasive surgical technique; however, deep infection and soft-tissue complications is still the main problems we have to face.

---

**Table No.1: Knee Society score**

<table>
<thead>
<tr>
<th>Pain (50 points)</th>
<th>50</th>
<th>50</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mild or occasional</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>Stairs only</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>Waling and stairs</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>Moderate occasional</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Moderate continual</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Severe</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Range of Motion 5 degrees = 1 point</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>Anteroposterior Stability (maximum movement in any position)</td>
<td>=10</td>
<td></td>
</tr>
<tr>
<td>5-10 mm</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>10 mm</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Medial lateral stability</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Flexion contracture</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>5-10 degrees</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>10-15 degrees</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>16-20 degrees</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>&gt;20 degrees</td>
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<tr>
<td>Extension lag</td>
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<td>&gt;20 degrees</td>
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<tr>
<td>0-4 degrees</td>
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<tr>
<td>11-15 degrees</td>
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<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Walking</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Unlimited</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>&gt;10 blocks</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>5-10 blocks</td>
<td>30</td>
<td></td>
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<tr>
<td>&lt;5 blocks</td>
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<td></td>
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<tr>
<td>Housebound</td>
<td>10</td>
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</tr>
<tr>
<td>Unable</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Stairs</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Normal up and down</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Normal ups down with rail</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>Up and down with rail</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>Up with rail; unable down</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Unable</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Deductions</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>Cane</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Two canes</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Crutches or walker</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Score</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knee Rating = 100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Function = 100</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(Adapted from : Install JN, CCRR 1989, 248: 12)
Lee et al. worked on 36 tibia condyle and all fractures were managed by less invasive system. Two patients got deep infection and one had to face skin necrosis. Most authors showing very good results of such complex fractures claims to be operated with external fixator initially to treat soft tissues problems and then they perform open reduction and internal fixation. The final outcome is best achieved by achieving the best time to operate. We operated very early, before development of edema and the we found very good results. All are familiar the most common soft tissues injuries which consist of swelling, bruising, wounds blister formation, and compartment syndrome. In case of double plating when open reduction was done the most common complication noted are overlying soft tissue necrosis, problems with wound healing, exposure of metallic hardware and deep infection. In other hand when implants with less invasive stabilization system (LISS) were used, there was high rate of postoperative malalignment and hardware irritation. Babis et al., reported 85% excellent and good results in a study. He also reported (3%) deep infection, (9.1%) pin tract infection and (3%) peep venous thrombosis. He treated tibia condyle fractures due to the high energy trauma with hybrid external fixator. Katariya et al. treated his patients with small wire external fixation having beaded “olive” wires. He reported good and excellent results in his 94.7% patients. Muhammad AK et al., also worked with ilizerove ring fixator with olive wires. All patients suffered tibia condyle fractures and he reported excellent and good result in 81.8%. Katsenis et al., treated type V and VI tibia fractures. He treated all his patients with small external fixators and olive wires. He also used minimal internal fixation in patients. He reported 76% excellence and good results.

We used minimum hard wares. We did not open the fracture or joint. We in addition also did bone grafting. We respect the soft tissues and the bony fragment. So we got a very good results.

CONCLUSION

We recommend that close percutaneous K-wires fixation with additional bone grafting and pop cast is best treatment in our setup. This is minimum invasive with less hard wares. Although there are chances of knee stiffness but you are safe from deep infection and other wound related complications. We did not compare with other treatment methods and this is a limitation of our work. But we have provide platform for comparative study in future.

Author’s Contribution:

Concept & Design of Study: Muhammad Iqbal
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Revisiting Critically: Attaullah, Sumble Arif
Muhammad Iqbal, Tauseef Ahmed Baluch

Final Approval of version: Muhammad Iqbal

Conflict of Interest: The study has no conflict of interest to declare by any author.

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Outcomes of Open Reduction and K-Wire Fixation of Lateral Humeral Condyle Fractures in Children Through Modified Anterolateral Henry Approach to the Elbow

Zulfiqar Ahmed¹, Muhammad Imran Haider¹, Muhammad Iqbal Buzdar², Azhar Rashid², Muhammad Ishfaq² and Ghulam Qadir Khan²

ABSTRACT

Objective: To determine the outcomes of open reduction and K-wire fixation for displaced lateral humeral condyle fracture in children through modified anterolateral Henry approach to elbow.

Study Design: Prospective/observational study.

Place and Duration of Study: This study was conducted at the Department of Orthopedics, Quaid-e-Azam Medical College/BV Hospital/ Civil Hospital, B/pur and NMU/Nishter Hospital, Multan from August 2017 to Jan. 2020.

Methodology: Twenty eight children with neglected humeral condyle fractures were enrolled in this study. Patients' age range was from 3 to 12 years. Patient's demographics including age, sex and cause of fractures were recorded. All patients underwent open reduction and K-wire fixation through modified anterolateral Henry approach to the elbow. Functional outcomes were examined at follow-up.

Results: Twenty two (78.57%) were males while 5 (21.43%) were females. Falling was the commonest cause of fracture found in 15 (53.57%) patients. All the patients achieved satisfactory range of motion. 20 (71.43%) patients showed good, 3 (10.71%) showed fair and 1 (3.57%) showed poor outcomes. 01 (3.57%) patient developed avascular necrosis of the fractured lateral condylar fragment, 01 (3.57%) patient had premature closure of physis and pin tract infection found in 2 (7.14%) patients.

Conclusion: Open reduction and K-wire fixation through anterior (Henry) approach is safe and effective surgical modality for lateral humeral condyle fractures especially in children especially in old neglected cases.

Key Words: Lateral humeral condyle fracture, Open reduction, Anterolateral (modified Henry) elbow approach, K-wire, Range of motion, Union, Complications

INTRODUCTION

Fracture of the lateral condyle of humerus constitute around 13-18% of elbow injuries, with the peak incidence occurring at the age of 6-7 years. The displaced fracture is considered as “fracture of necessity” and it is generally agreed that it should be treated by osteosynthetic procedures.¹ These fractures could occur by either a pull-off injury, in which avulsion of the lateral condyle occurs at the origin of the extensor/supinator musculature when a varus stress is applied to the extended elbow with the forearm supinated (the most common mechanism of injury), or a push-off injury, in which a fall onto the extended hand affects the radial head against the lateral condyle, causing the fracture.²

The most often used classification (Jacobs classification) of lateral humeral condyle fractures is based on the amount of displacement between the fragments, Type I has <2 mm displacement of the metaphyseal fragment, Type II has 2-4 mm displacement, and Type III, is completely displaced with rotation. The fracture occurs from falling on the outstretched arm with the elbow supinated, placing a varus stress on the elbow. Non-displaced or minimally displaced Type I fractures can easily be treated with a cast, as can some Type II fractures.³ However open reduction and fixation with K-wires is the treatment of choice for most type 2 and type 3 fractures because it prevents complications that arise due to unreduced or non-united fractures.⁴,⁵

Fresh injuries with displaced and rotated fracture fragments can be anatomically reduced and fixed easily.
and accurately through traditional lateral approach but in case of neglected and old fractures the reduction and direct visualization of the fracture fragment ends for accurate and anatomical reduction due to its intra-articular nature becomes very much difficult through traditional lateral approach. The late presentation of these fractures pose multiple difficult and challenging problems. The fractured surfaces become sclerosed, the fracture fragments covered and fracture gap filled with fibrous tissue, the muscular attachments become shortened and contracted thus making derotation and anatomical realignment/reduction very difficult through traditional lateral approach. Excessive soft tissue dissection done in order to access the fracture site in order to achieve good anatomical reduction through lateral approach may lead to loss of blood supply of the fracture fragment followed by avascular necrosis of the fragment or the displaced & rotated fracture fragment may itself get completely detached and free from its muscular attachment. However, complications associated with this fracture such as non-union, premature physeal closure, lateral condylar overgrowth, stiffness, cubitus valgus/varus, avascular necrosis and tardy ulnar nerve palsy may arise after surgical or conservative treatment. We conducted present study to examine the functional outcomes of open reduction and K-wire fixation for the management of lateral condyle humeral fractures in children through modified anterolateral Henry approach to the elbow.

MATERIALS AND METHODS

This study was conducted at Orthopedic Complex and Civil Hospital of the Quaid-e-Azam Medical College Bahawalpur and NMU/Nishtar Hospital, Multan from 1st August 2017 to 31st January 2020. Twenty eight children of both genders with neglected humeral condyle fractures were enrolled in this study. Patients ages were 3 to 12 years. Patient’s demographics including age, sex, cause and site of fractures were recorded after taking informed written consent from all the parent/guardians of the patients. Patients with previous surgery of elbow fracture and those with no consent were excluded from this study. Antero-posterior & lateral view x-rays were obtained before planning for surgery (Fig-1). All the patients received surgical treatment with open reduction and K-wire fixation through modified Henry anterolateral approach to the elbow joint. All patients were operated in supine position under general anesthesia. Pre & postoperative parenteral antibiotics were given to all the patients. Tourniquet was applied at proximal arm to achieve bloodless field. Skin incision started at a point proximal and lateral to the biceps tendon, extended distally and medially along the medial border of brachioradialis to end into the proximal forearm. Plane was developed between brachioradialis and radial nerve laterally and brachialis along with biceps tendon & pronator teres medially. Anterior surface of distal humerus metaphysis exposed. Joint capsule opened longitudinally anteriorly. Intra-articular fibrous tissue excised, displaced fracture fragment freed from adhesions and fibrous tissue, derotated as needed, then reduced (Fig-2) and fixed with two or three K-wires placed at angle. Reduction status evaluated and confirmed per-operatively by radiology, capsular incision repaired, wound closed in layers over drain after releasing the tourniquet and securing the hemostasis. Long arm back splint given. drain removed within 48 hours. Finger movements started to the tolerance. Post-operative x-rays (Fig.3) obtained. Stitches removed at first follow up after 02 weeks and subsequent x-rays & clinical evaluation done at 06 weeks, 12 weeks and along with range of motion exercises which were started at appropriate stage after removing the back splint on ascertaining the status of fracture union. Follow-up clinical evaluation and post-operative x-rays (Fig-4) do neat 06 and 12 months. Functional outcomes were examined according to the Agarwal et al criteria. All the data was analyzed by using SPSS 24.

RESULTS

There were 23 (82.14%) males while 5 (17.86%) were females. Five (17.86%) patients were ages <5 years, 16 (57.14%) patients were ages 5 to 8 years and 7 (25%) were ages 9 to 12 years. Falling from height was the commonest cause of fracture found in 17 (60.71%) patients followed by RTA 6 (21.43%), sports related injury in 4 (14.29%) patients and 1 (3.57%) patient had other. According to time since injury to surgery 16 (57.14%) patients had <5 weeks while 12 (42.86%) had 5 to 10 weeks.

| Table No. 1: Demographics of all the patients |
| --- | --- | --- |
| Variable | No. | % |
| Gender | | |
| Male | 23 | 82.14 |
| Females | 5 | 17.86 |
| Age (years) | | |
| <5 | 5 | 17.86 |
| 5 - 8 | 16 | 57.14 |
| 9 - 12 | 7 | 25.0 |
| Aetiology | | |
| Falling | 17 | 60.71 |
| RTA | 6 | 21.43 |
| Sports | 4 | 14.29 |
| Other | 1 | 3.57 |
| Time since injury to surgery (weeks) | | |
| <5 | 16 | 57.14 |
| 5 - 10 | 12 | 42.86 |

As per Jacob classification 15 (53.57%) had type II and 13 (46.43%) had type III fractures (Table 1). All the
patients achieved satisfactory range of motion. 20 (71.43%) patients showed excellent, 4 (14.29%) showed good, 3 (10.71%) showed fair and 1 (3.57%) showed poor outcomes (Table 2). According to the complications noted, 01 (3.57%) patient developed avascular necrosis, 01 (3.57%) patient had premature closure of physis and pin tract infection found in 02 (7.14%) patients (Fig-5).

Table No. 2: Functional outcomes at final follow up

<table>
<thead>
<tr>
<th>Outcome</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excellent</td>
<td>20</td>
<td>71.43</td>
</tr>
<tr>
<td>Good</td>
<td>4</td>
<td>14.29</td>
</tr>
<tr>
<td>Fair</td>
<td>3</td>
<td>10.71</td>
</tr>
<tr>
<td>Poor</td>
<td>1</td>
<td>3.57</td>
</tr>
</tbody>
</table>

DISCUSSION
Neglected fractures of humeral condyle are among the commonest fractures in children of age 03 years and above. In Pakistan these types of fractures usually present late and this leads to develop severe complications. Surgical treatment for neglected humeral condyle fractures is considered a treatment of choice due to its high success rate and fewer complications. Displaced fracture of lateral humeral condyle in children is considered as ‘fracture of necessity’ and deserves appropriate treatment. We conducted present study to examine the functional outcomes of open reduction and K-wire fixation for the management of lateral humeral condyle fractures in children through modified anterolateral Henry approach for elbow. In this regard 28 patients were enrolled. Majority of patients 82.14% were males while 17.86% were females. The results showed similarity to other previous studies in which male patient population was high 70% to 90% as compared to females. In our study we found that majority of children 57.14% were ages 5 to 8 years followed by 25% had ages 9-12 years. Studies demonstrated that majority of patients with elbow fractures were ages 3 to 7 years. In present study falling from height was the commonest cause of fracture found in 17 (60.71%) patients followed by RTA 6 (21.43%), sports related injury in 4 (14.29%) patients and 1 (3.57%) patient had other. A study conducted by Pant et al reported that falling from height found in 55.5% followed by sports and traffic accidents.

We found at final follow-up that 20 (71.43%) patients showed excellent, 4 (14.29%) showed good, 3 (10.71%) showed fair and 1 (3.57%) showed poor outcomes. A study conducted by Mahar et al reported in their study that 29% patients had excellent, 16.1% had good, 9.7% had fair and 45.1% had poor functional outcomes after surgical management of neglected humeral condyle fractures by open reduction and K-wire fixation. Another study by Sial et al regarding outcomes of open reduction and K-wire fixation of displaced lateral condyle fractures of the humerus reported 54.4% patients had excellent, 18.18% had good, 13.64% had fair and 13.64% had poor functional outcomes. Ghosh et al reported that 60% patients received full range of motion who under went open reduction and internal fixation for lateral condyle fractures of humerus.

In present study we found that 1 (3.57%) patients developed avascular necrosis and elbow stiffness, 1 (3.57%) patient had premature closure of physis and 2 (7.14%) patients had pin tract infection. These results were comparable to many of previous studies.

CONCLUSION
Open reduction and K-wire fixation is safe and effective surgical modality for lateral humeral condyle fractures in children even in cases presenting late. Keeping in view the difficulty of soft tissue dissection
and anatomical reduction in case of late presenting patients, instead of using traditional lateral approach, we opted for modified anterolateral Henry approach for elbow to directly visualize the fracture site and status of fracture reduction. Overall 85.72% patients showed excellent functional outcomes and only few patients developed complications.

**Author’s Contribution:**

**Concept & Design of Study:** Zulfiqar Ahmed

**Drafting:** Muhammad Imran, Haider, Muhammad

**Data Analysis:** Azhar Rashid, Muhammad Ishfaq, Ghulam Qadir Khan

**Revisiting Critically:** Zulfiqar Ahmed, Muhammad Imran, Haider

**Final Approval of version:** Zulfiqar Ahmed

**Conflict of Interest:** The study has no conflict of interest to declare by any author.

**REFERENCES**

Wound Complications: Subcuticular Suture versus Skin Staples for Skin Closure after Caesarean Section

Sabahat Zafar

ABSTRACT

Objective: To compare the frequency of wound infection with subcuticular suture versus skin staples for skin closure after caesarean section.

Study Design: Randomized controlled trial study.

Place and Duration of Study: This study was conducted at the Department of Obstetrics and Gynaecology, Jinnah Hospital, Lahore from January 2014 to July 2014.

Materials and Methods: A total of 500 cases (250 cases in each group). Patients were randomly divided in two equal groups. Patients in Group A were stitched by subcuticular suture maternal while patients in group B were stitched with metal staples.

Results: In group A, mean gestational age was 38.60±1.23 weeks and in group B, 38.71±1.33 weeks. Regarding parity, 120 patients (48.0%) from group A and 127 patients (50.8%) from group B were having parity 0-2. In group A, 130 patients (52.0%) and in group B, 123 patients (49.2%) were para 3-5. Wound infection was observed in 18 patients (7.2%) and 36 patients (14.4%) in groups A and B, respectively. There was a statistically significant difference between two groups (p=0.009).

Conclusion: A significantly less wound infection with subcuticular suture when the cesarean delivery skin incision was closed with suture rather than with staples.

Key Word: Caesarean section, Subcuticular suture, Skin staples for skin closure

INTRODUCTION

Caesarean section is one of the most common obstetric procedures, and on an average, 20-25% of pregnancies are delivered by CS. However, the rising incidence of CS has also led to an increase in complications, which are now reported to occur in 2.5-16% of cases. Most of the major steps during cesarean section have been evaluated and evidence-based recommendations made to enhance best practice. With regards to skin closure, skin can be reaproximated by a subcuticular suture immediately below the skin or by staples. Skin wounds are the only step of CS in which patients are able to see and evaluate. It can be distressing for patients if they can see that their CS wound has not healed appropriately and this can impact upon their quality of life.

Ominously, the precise technique used for wound closure following CS is the only step in this common operation that is not supported by conclusive evidence. Consequently, there is significant debate as to which technique and material should be used for CS skin closure. There are many different techniques used to close skin wounds, including subcuticular stitches with absorbable or non-absorbable sutures, interrupted stitches, staples and skin adhesives. Staples and subcuticular stitches are the most popular techniques. The most commonly used sutures are synthetic polyfilament sutures made from polyglycolic acid (Dexon) or polyglactin (Vicryl). Surgeons generally select the closure method and material according to personal preference. Existing studies on the rate of complications, the degree of patient satisfaction and the cost-effectiveness of CS have not yet identified the best evidence-based recommendation for wound closure technique and material; furthermore, existing data are contradictory. Some studies report increased rates of postoperative pain with sutures, while others describe increased rates of postoperative pain with staples. Other papers show no difference in cosmetic outcome and patient satisfaction when comparing between staples and sutures, although some have shown improved cosmetic outcomes with sutures. Worryingly, wound separation data are also contradictory. Staples have been associated with a shorter procedural time than
subcuticular sutures, but with a higher incidence of wound separation.\textsuperscript{10} The present study was conducted aimed to compare the frequency of wound infection with subcuticular suture versus skin staples for skin closure after caesarean section.

**MATERIALS AND METHODS**

This randomized controlled trial was conducted at Department of Obstetrics and Gynaecology, Jinnah Hospital, Lahore from 10\textsuperscript{th} January 2014 to 9\textsuperscript{th} July 2014 and comprised 500 cases. They were divided in two equal groups; each group comprised 250. Patients in Group A were stitched by subcuticular suture maternal while patients in group B were stitched with metal staples. All the females of age 18-40 years at term (gestational age >36 weeks on USG) and parity <6 were included. Maternal obesity BMI >35 and high risk females, pre-eclamptic, eclamptic women and women with gestational diabetes were excluded from this study. Demographic information (name, age, gestational age, parity and contact) of the patients were obtained. All surgeries were done by a single surgical team. Patients were remained in ward for 3 days and discharged after complete wound examination. Patients were asked to come after 10 days of caesarean section or report earlier if they develop two or more of these symptoms i.e. redness, fever (>100°C), pus and serous discharge in wound. Patients who developed wound infection were managed as existing unit guidelines. The data was analyzed by using SPSS version 20. Chi square test was applied to compare frequency of wound infection both groups. P value <0.05 was considered as significant.

**RESULTS**

One hundred seventy three (69.2\%) patients in group A and 179 (75.6\%) patients in group B were between 20-30 years old and 77 (30.8\%) patients in group A and 71 (24.4\%) patients in group B were between 31-40 years of age. Mean age was 28.22±4.91 and 28.01±4.72 in group A and B, respectively (Table 1). In group A, mean gestational age was 38.60±1.23 weeks and in group B, 38.71±1.33 weeks (Table-2).

Regarding parity, 120 patients (48.0\%) from group A and 127 patients (50.8\%) from group B were having parity 0-2. In group A 130 patients (52.0\%) and in group B, 127 patients (49.2\%) were para 3-5 (Table-3). Wound infection was observed in 18 patients (7.2\%) and 36 patients (14.4\%) in groups A and B respectively. There was a statistically significant difference between two groups (p=0.009) (Table-4).

**DISCUSSION**

Cesarean section is one of the most performing surgical procedures in all over the world with high rate of complications such as wound infection, cosmetic complications, post-operative pain, fever etc.\textsuperscript{11} Many of surgical techniques have been applied to reduce the complications rate especially wound infection, because it may lead to severe morbidity after surgical intervention.\textsuperscript{12,13} The present study was conducted aimed to compare the prevalence of wound infection with subcuticular suture versus staples for skin closure after cesarean section. In this regard 500 women were analyzed and divided equally in to two groups. Majority of women in both groups A and B were ages between 20 to 30 years 69.2\% and 75.6\%, Mean age was 28.22±4.91 and 28.01±4.72 and mean gestational age was 38.60±1.23 weeks and 38.71±1.33 weeks. No significant difference was observed regarding age and gestational age between both groups. These results showed similarity to many of other studies in which majority 70\% to 80\% of women had ages 20 to 30 years and average gestational age was 37.5 weeks.\textsuperscript{14,16} In presents study wound infection was observed in 18 patients (7.2\%) and 36 patients (14.4\%) in groups A and B respectively. There was a statistically significant difference between two groups (p=0.009). A study conducted by Hasdemir et al\textsuperscript{17} reported no significant difference in term of wound complication was observed between absorbable and nonabsorbable suture techniques with p-value >0.05. However, a study conducted by Nayak et al\textsuperscript{18} regarding comparison of subcuticular suture versus staples in term of wound complications after cesarean sections and they demonstrated that staples skin closure technique had significantly higher incidence of wound complications.

<table>
<thead>
<tr>
<th>Age (Year)</th>
<th>Group A</th>
<th>Group B</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-30</td>
<td>173</td>
<td>179</td>
</tr>
<tr>
<td>31-40</td>
<td>77</td>
<td>71</td>
</tr>
<tr>
<td>Mean±SD</td>
<td>28.22±4.91</td>
<td>28.01±4.72</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parity</th>
<th>Group A</th>
<th>Group B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Para 0-2</td>
<td>120</td>
<td>127</td>
</tr>
<tr>
<td>Para 3-5</td>
<td>130</td>
<td>123</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Wound infection</th>
<th>Group A</th>
<th>Group B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>18</td>
<td>36</td>
</tr>
<tr>
<td>No</td>
<td>232</td>
<td>214</td>
</tr>
</tbody>
</table>

Chi Square = 6.73
P value = 0.009

Table No.2: Distribution of cases by gestational age

<table>
<thead>
<tr>
<th>Gestational age (week)</th>
<th>Group A</th>
<th>Group B</th>
</tr>
</thead>
<tbody>
<tr>
<td>37-38</td>
<td>138</td>
<td>132</td>
</tr>
<tr>
<td>39-41</td>
<td>112</td>
<td>118</td>
</tr>
<tr>
<td>Mean±SD</td>
<td>38.60±1.23</td>
<td>38.71±1.33</td>
</tr>
</tbody>
</table>

Table No.3: Distribution of cases by parity

<table>
<thead>
<tr>
<th>Parity</th>
<th>Group A</th>
<th>Group B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Para 0-2</td>
<td>120</td>
<td>127</td>
</tr>
<tr>
<td>Para 3-5</td>
<td>130</td>
<td>123</td>
</tr>
</tbody>
</table>

Table No.4: Comparison of wound infection
30% as compared to 8% in subcuticular suture with p-value 0.0001.
Al-kadri et al. reported that patients in the subcuticular group (G2) had a risk of developing overall wound complications that was double that for the group of patients treated by staples (OR = 2.41; 95% CI: 1.17-4.98; p = 0.02). Zaki et al. reported no significant difference between both techniques regarding frequency of wound complications, composite wound complication frequency was 19.3% in the staples group and 17.6% in the subcuticular suture group (P = .74) with an overall wound complication incidence of 18.5% in the entire study cohort.
Some other previous studies showed similarity to our study findings regarding wound complications in which sutures demonstrated a better technique with lower rate of wound complications as compared to staples for skin closure after cesarean sections.21,22

CONCLUSION
We concluded a significantly less wound infection with subcuticular suture when the cesarean delivery skin incision was closed with suture rather than with staples.

Author’s Contribution:
Concept & Design of Study: Sabahat Zafar
Drafting: Sabahat Zafar
Data Analysis: Sabahat Zafar
Revisiting Critically: Sabahat Zafar
Final Approval of version: Sabahat Zafar

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES


Comparison of Mask versus Prong for Delivery of Continuous Airway Pressure in Premature Neonates with Tachypnea in Terms of Continuous Positive Airway Pressure Failure

Shaukat Hussain, Muhammad Tayyab and Muhammad Arslan Farooq

ABSTRACT

Objective: To compare mask and prong for delivery of CPAP in management of premature neonates with tachypnea in terms of frequency of CPAP failure.

Study Design: Randomized controlled trial study.

Place and Duration of Study: This study was conducted at the Department of Pediatrics, Holy Family Hospital Rawalpindi from September 2018 to February 2019.

Materials and Methods: One hundred and twenty pre-term infants with gestational age from 27-34 weeks of any gender were included. They were divided in two groups; randomized to receive either mask (Group 1) and prong (Group 2) as a mode of NCAP delivery interface.

Results: Comparison of mask versus prong for delivery of CPAP in management of premature neonates with tachypnea in terms of frequency of CPAP failure shows 5% (n=3) in Group 1 and 11.67% (n=7) in Group 2 with p value was 0.18.

Conclusion: Mask for delivery of continuous airway pressure in management of premature neonates with tachypnea in terms of frequency of CPAP failure has less frequency as compared to prong.

Key Words: Preterm, Tachypnea, Failure of CPAP, Nasal mask, Nasal prong

INTRODUCTION

Continuous increased airway pressure is used for management of pre-term neonates who have respiratory distress. It is simple, non invasive, easy to use and low cost method of ventilation in a child born with respiratory distress. Approximately 15 million babies are born preterm annually with mortality rate of almost 35 percent due to complications of preterm birth. Lack of pulmonary surfactant is the cause of respiratory distress in preterm babies causing immature pulmonary development and alveolar collapse. Clinically pre term babies present with progressive dyspnea and respiratory failure shortly after birth. Combination of pulmonary surfactant along with nasal positive airway pressure can maintain alveoli open to improve oxygenation and decrease respiratory distress.

Department of Pediatrics, Holy Family Hospital Rawalpindi.

Mechanical positive airway pressure ventilation using tracheal intubation has been used but it is associated with complications like pneumothorax, respiratory infections and trauma. There have been improvements in management of new born with respiratory distress, however controversies exist in most effective method of mechanical ventilation with least complications. Less invasive continuous increased pressure in nasal cavities is an approved method of ventilation support in neonates. Continuous increased pressure in nasal cavities can be given either via nasal prongs or nasal mask. Limitations to deliver continuous positive airway pressure via nasal prongs include difficult positioning of neonate, nasal injuries, difficulty in maintaining nasal prongs and poor tolerance. Other method of giving positive nasal airway pressure is by using nasal masks. Advantages of using nasal masks instead of nasal prongs are ease of application, better tolerance and less nasal trauma. Nasal continuous positive airway pressure use has been increased recently and it is replacing conventional mechanical ventilation using endotracheal tube. Different studies show different results regarding CPAP failure when comparing nasal mask vs nasal prongs. In a study by Goel et al that CPAP failure occurred in 13% of patients in mask group and 25% in nasal prongs group. In another study by Chandrasekar et al there was no difference in the incidence of CPAP failure in...
Comparison of mask vs prong for delivery of continuous airway pressure in management of premature neonates with tachypnea in terms of frequency of CPAP failure shows 3 (5%) in Group 1 and 7 (11.67%) in Group 2 with P value was 0.18. Effect modifiers like gender were controlled by stratification. P-value taken statistically significant was <0.05 (Table 2).

**DISCUSSION**

Standard mode of therapy for premature neonates with tachypnea is nasal CPAP. Safety and comfort associated with nasal CPAP is highlighted with increased use of this non invasive mode of ventilation. Injuries associated with this modality range from 20-60% and consist of nasal tip blanching, necrosis of nasal septum and septal drop but major factors associated with these injuries are gestational age, lower birth weight and prolonged duration of treatment on this mode. In addition to this, type of nasal interface has also major contribution in injury. This study was to compare the mask vs prong and to promote the use of mask for delivery of continuous airway pressure in premature neonates with tachypnea because it has less failure rate, is easy to apply, more tolerable and less traumatic as compared to nasal prongs.

In this study 33 (55%) in Group 1 and 37 (61.67%) in Group 2 were male whereas 27 (45%) in Group 1 and 23 (38.33%) in Group 2 were females. The gestational age shows 31 (51.67%) in Group-1 and 29 (48.33%) in Group 2 were between 27-30 weeks whereas 29 (48.33%) in Group 1 and 31 (51.67%) in Group 2 were between 31-34 weeks with mean gestational ages were 30.52±1.86 weeks in Group 1 and 30.57±1.62 weeks (Table 1).

**MATERIALS AND METHODS**

This randomized controlled trial was conducted at Department of Pediatrics, Holy Family Hospital Rawalpindi from 1st September 2018 28th to February 2019. A total of 120 pre term infants with gestational age from 27-34 weeks of any gender were included. They were divided in two groups; mask (Group 1) and prong (Group 2) as a mode of NCAP delivery interface. Randomization was done using a computer generated randomization chart. Informed consent was taken from the child’s parents/guardian. Infants in the Mask group were delivered NCPAP using Infant Nasal Mask. Infants in the Prong group were delivered NCPAP using appropriate size Infant Nasal Prong CPAP cannula system (size 0 and 1). Babies in both the groups were administered natural bovine surfactant (Survanta) at a dose of 100mg/Kg in 4 equal aliquots by INSURE. All infants enrolled in the study received a loading dose of 10 mg/kg caffeine base and then 2.5 mg/kg 24 hours after the loading dose and daily thereafter. Both the groups were observed for 24 hours for CPAP failure and recorded. The data was entered and analyzed through SPSS-20.

**RESULTS**

Gender distribution of the patients was done, it shows that 33 (55%) in Group 1 and 37 (61.67%) in Group 2 were male whereas 27 (45%) in Group 1 and 23 (38.33%) in Group 2 were females. The gestational age shows 31 (51.67%) in Group-1 and 29 (48.33%) in Group 2 were between 27-30 weeks whereas 29 (48.33%) in Group 1 and 31 (51.67%) in Group 2 were between 31-34 weeks with mean gestational ages were 30.52±1.86 weeks in Group 1 and 30.57±1.62 weeks (Table 1).

**Table No.1: Frequency of gender and gestational age (n=120)**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group 1</th>
<th>Group 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>33 (55%)</td>
<td>37 (61.67%)</td>
</tr>
<tr>
<td>Female</td>
<td>27 (45%)</td>
<td>23 (38.33%)</td>
</tr>
<tr>
<td>Gestational age (weeks)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>27-30</td>
<td>31 (51.67%)</td>
<td>29 (48.33%)</td>
</tr>
<tr>
<td>31-34</td>
<td>29 (48.33%)</td>
<td>31 (51.67%)</td>
</tr>
<tr>
<td>Mean±SD</td>
<td>30.52±1.86</td>
<td>30.57±1.62</td>
</tr>
</tbody>
</table>

Comparison of mask vs prong for delivery of continuous airway pressure in management of premature neonates with tachypnea in terms of frequency of CPAP failure shows 3 (5%) in Group 1 and 7 (11.67%) in Group 2 with P value was 0.18. Effect modifier like gender were controlled by stratification. P-value taken statistically significant was <0.05 (Table 2).

**Table No.2: Stratification of CPAP failure according to gender and gestational age (n=120)**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Group 1 (n=60)</th>
<th>Group 2 (n=60)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>Yes</td>
<td>Yes</td>
<td>0.20</td>
</tr>
<tr>
<td>No</td>
<td>32</td>
<td>33</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>Yes</td>
<td>Yes</td>
<td>0.51</td>
</tr>
<tr>
<td>No</td>
<td>25</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Gestational age (weeks)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>27-30</td>
<td>Yes</td>
<td>Yes</td>
<td>0.59</td>
</tr>
<tr>
<td>No</td>
<td>29</td>
<td>28</td>
<td></td>
</tr>
<tr>
<td>31-34</td>
<td>Yes</td>
<td>Yes</td>
<td>0.05</td>
</tr>
<tr>
<td>No</td>
<td>28</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>27-34</td>
<td>Yes</td>
<td>Yes</td>
<td>0.18</td>
</tr>
<tr>
<td>No</td>
<td>57</td>
<td>53</td>
<td></td>
</tr>
</tbody>
</table>
Different studies show different results regarding CPAP failure when comparing nasal mask vs nasal prongs. In a study by Goel et al, reported that CPAP failure occurred in 13% of patients in mask group and 25% in nasal prongs group. In another study by chandrasekaran A et al there was no difference in the incidence of CPAP failure in both groups. In another study by Say B et al the failure rate of prong technique was higher vs mask modality 8% vs 2%. A recently conducted meta-analysis concluded that rate of CPAP failure is much lower with mask technique as well as chances of nasal injury and stress are also negligibly low, but it needs a well powered RCT to strengthen their views.

Another meta-analysis that compared mask vs prong technique in terms of efficacy and nasal injury in premature neonates on CPAP; total five trials were included but effectiveness was judged in only four trials (n=459 neonates), while nasal injury was assessed in three trials (n=275 neonates). They concluded that rate of CPAP failure with mask is significantly lower, [RR 0.63 (CI 0.45 to 0.88)] as well as nasal injury [RR 0.41 (CI 0.24 to 0.72)]. Moderate to severe nasal injury was observed in 36 out of 137 neonates (26%) in prong group and 14 out of 138 neonates in mask group (10%) respectively, but few limitations were seen in this meta-analysis like inadequate sample size, ethnicity of participants, inequality in interventions and inappropriate standard to measure nasal injury. Contrary to this meta-analysis our study has large sample size with no ambiguity in patient inclusion criteria, inclusion of neonates with equal chances of CPAP failure and nasal injury, usage of similar equipment i.e. dropper baby flow mask and Hudson prongs.

In another study of Newnam et al who compared mask vs prong and alternate mask / prong techniques in post extubated neonates who were assigned CPAP by either mask (n=35) or prong (n=21) or alternating technique (22), chances of skin injury erythema or excoriatio P-values (P<0.001, P<0.007) respectively were less in alternating group as compared to mask or prong groups. Few limitations were also present in this trial i.e. small sample size, considering only post extubated neonates, non-randomization, differential birth weight among groups and subjective assessment for nasal injury.

Despite of all measures to counter different effect modifiers like medications, interventions, subjective assessment and carefully selecting inclusion / exclusion criteria our study showed decreased chances of CPAP failure in mask vs prong group.

CONCLUSION

Mask technique for delivery of continuous airway pressure in management of premature neonates with tachypnea in terms of frequency of CPAP failure has less frequency as compared to prong.

Author’s Contribution:

Concept & Design of Study: Shaukat Hussain
Drafting: Muhammad Tayyab
Data Analysis: Muhammad Arslan
Revisiting Critically: Shaukat Hussain, Muhammad Tayyab
Final Approval of version: Shaukat Hussain

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES


Compare the Effectiveness in Term of Attenuating Stress Response between Oral Pregablin and Intravenous Lignocaine in Patients with Hypertension

Faiqa Qurban¹, Salman Athar Qureshi¹, Syed Imran ul Hassan², Kanwal Awan², Maryam Liaqat² and Yasir Ijaz²

ABSTRACT

Objective: To compare the efficacy of oral pregablin with intravenous lignocaine in term of attenuating pressor response in patients presented with hypertension.

Study Design: Randomized controlled trial study.

Place and Duration of Study: This study was conducted at the Main Operation Theatre DHQ Teaching Hospital/ Gujranwala Medical College, Gujranwala and Anaesthesia Department PIC, Lahore from October 2019 to February 2020.

Materials and Methods: One hundred and four hypertensive patients of both genders with ages 20 to 65 years undergoing elective surgeries were enrolled in this study. All the patients were equally divided into two groups, each group contains 52 patients. Group I received oral pregablin and group II received IV lignocaine. Heart rate, systolic BP and diastolic BP were examined before and after intubation between both groups.

Results: No significant difference was observed between both groups regarding age, sex and body mass index (BMI) with p-value >0.05. Before intubation no significant difference was observed regarding heart rate, systolic and diastolic BP. A significant lower heart rate was found in group I after intubation 91.28±12.66 beat/min as compared to group II 97.86±13.44 (p-value <0.05). In group I mean systolic BP and diastolic BP after intubation were significantly lower than the group II with p-value <0.05.

Conclusion: Oral pregablin had better efficacy for attenuating stress response as compared to intravenous lignocaine in patients with hypertension.

Key Words: Hypertension, Intubation, Stress response, Pregablin, Lignocaine, Elective surgery


INTRODUCTION

Endotracheal intubation is considered an integral part of the anesthesiologist’s contribution in patient care. However, it is an oxious stimulus that may initiate a transient sympathetic response in the form of increased heart rate, blood pressure, and arrhythmias. Moreover, this response may be marked in some cases.¹

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Patients with systemic hypertension generally exhibit exaggerated response during laryngoscopy and intubation.²³ Stress response is usually transient and is well tolerated in healthy individuals without any significant effects. But in certain population with comorbid conditions like coronary artery disease and hypertension the response can result in adverse events like myocardial infarction and arrhythmias. Some of the methods by which the stress response can be minimized are by using judicious premedication, performing intubation in a deeper plane, gentle laryngoscopy, avoiding laryngeal manipulation and with drugs like beta blockers, opioids, calcium channel blockers, vasodilators and alpha agonists just before intubation. Among the pharmacological methods lignocaine is the widely used drug. Gaba pentinoids, derivatives of gamma aminobutyric acid (GABA) have been primarily used for neuropathic pain, as well as various off-label indications.⁶⁷ Pregabalin is a structural analogue of gaba pentin with additional advantage of having bioavailability of 90% compared to 60% of gaba pentini.⁷⁸ After oral administration peak levels are achieved within one hour.
conducted present study to compare the efficacy between oral pregablin and intravenous lignocaine for attenuating stress response in patients with hypertension.

MATERIALS AND METHODS

This randomized controlled trial was conducted at Main Operation Theatre DHQ Teaching Hospital/ Gujranwala Medical College, Gujranwala and Anaesthesia Department PIC, Lahore from 1st October 2019 to 29th February 2020. A total of 104 hypertensive patients of both genders with ages 20 to 65 years undergoing elective surgeries were enrolled in this study. Patient’s detailed demographics including age, sex, and body mass index were recorded. Pregnant women, patients with anticipated difficult airway, patients with cardiac issues, neurological disorder and those with no consent were excluded. All the patients were equally divided into two groups, each group contains 52 patients. Group I received oral pregablin 150 mg before surgery and group II received IV lignocaine 1.5 mg/kg before intubation. Heart rate, systolic BP and diastolic BP were examined before and after intubation at 1, 5 and 10 minutes between both groups. Hemodynamic change in stress response parameters were examined. All the data was analyzed by SPSS 24. Chi-square test was done to compare the findings between both groups and p-value <0.05 was taken as significant.

RESULTS

There were 30 (57.69%) male and 22 (42.31%) female with mean age 35.26±10.48 years in group I, in group II 27 (51.92%) patients were male and 25 (48.08%) were females with mean age 36.44±9.06 years. Mean BMI in group I was 25.63±3.24 kg/m² and in group II it was 25.35±3.86 kg/m². No significant difference was observed between both groups regarding age, gender and BMI with p-value >0.05 (Table 1). According to the heart rate, no significant differences was observed at baseline (p-value >0.05), a significant decrease was found at 1, 5 and at 10 minute in both groups with p-value <0.05. Patients received oral pregablin had significantly lower heart rate at 1, 5 and at 10 minute as compared to patients received intravenous lignocaine [P<0.05] (Table 2). According to the systolic BP, no significant differences was observed at baseline (p-value >0.05), a significant decrease was found at 1, 5 and at 10 minute in both groups with p-value <0.05. Patients received oral pregablin had significantly lower diastolic BP rate at 1, 5 and at 10 minute as compared to patients received intravenous lignocaine [P<0.05] (Table 4). We found none of the patient has suffered from any post-operative side-effects, and no significant differences in the parameters of recovery and awakening time were observed.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group I</th>
<th>Group II</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>35.26±10.48</td>
<td>36.44±9.06</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>25.63±3.24</td>
<td>25.35±3.86</td>
<td>&gt;0.05 (not significant)</td>
</tr>
</tbody>
</table>

Table No.1: Demographics of all the patients

<table>
<thead>
<tr>
<th>Variables</th>
<th>Group I</th>
<th>Group II</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>85.25±9.66</td>
<td>86.07±8.53</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>At 1 Minute</td>
<td>91.28±12.66</td>
<td>97.86±13.44</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>At 5 Minute</td>
<td>83.54±10.25</td>
<td>92.73±11.48</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>At 10 Minutes</td>
<td>79.86±8.36</td>
<td>87.74±9.36</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Table No.2: Comparison of heart rate between both groups

<table>
<thead>
<tr>
<th>Variables</th>
<th>Group I</th>
<th>Group II</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>130.32±10.56</td>
<td>131.03±9.42</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>At 1 Minute</td>
<td>120.64±12.42</td>
<td>126.84±11.14</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>At 5 Minute</td>
<td>112.73±8.48</td>
<td>121.76±10.22</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>At 10 Minutes</td>
<td>107.52±7.74</td>
<td>115.02±8.93</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Table No.3: Comparison of systolic BP between both groups

<table>
<thead>
<tr>
<th>Variables</th>
<th>Group I</th>
<th>Group II</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>84.16±8.84</td>
<td>85.32±8.35</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>At 1 Minute</td>
<td>71.82±7.42</td>
<td>78.45±9.44</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>At 5 Minute</td>
<td>65.55±6.56</td>
<td>72±11.48</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>At 10 Minutes</td>
<td>64.28±7.86</td>
<td>70.43±8.47</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

DISCUSSION

Haemodynamic pressor response to airway instrumentation (direct laryngoscopy and intubation) is a hazardous complication of general anaesthesia. Many pharmacological techniques were evaluated either in the premedication or during the induction to attenuate these adverse haemodynamic responses to...
airway instrumentation, such as deepening the anaesthesia, pre-treatment with vasodilators, adrenoceptor blockers, calcium channel blockers and opioids, with variable results.\textsuperscript{10,11} We conducted present study to compare the efficacy of oral pregablin and IV lignocaine for attenuating stress response in patients with stage-1 hypertension. In this regard 104 patients of both genders whom were undergoing elective surgeries under general anaesthesia were analyzed. Patients were divided equally in to two groups, group I received oral pregablin one hour before surgery and other group received IV lignocaine before intubation. Majority of patients in both groups were male 57.69% and 51.92% as compared to females 42.31% and 48.08%. Mean age of pregablin group patients was 35.26±10.48 years and in lignocaine group it was 36.44±9.06. No significant difference was observed between both groups regarding gender, age and body mass index with p-value >0.05. These results were comparable to previous studies in which majority of patients were male 55% to 65% as compared to females and average age of patients was 30 years whom were undergoing elective surgeries under general anesthesia.\textsuperscript{12,13}

In present study we found that patients whom were received pregablin had better attenuated stress response as compared to IV lignocaine. We found that According to the heart rate, systolic and diastolic BP no significant differences was observed at baseline (p-value >0.05), a significant decrease was found at 5 and at 10 minute in both groups with p-value <0.05. Patients received oral pregablin had significantly lower heart rate, systolic BP and diastolic BP at 1, 5 and at 10 minute as compared to patients received intravenous lignocaine (p-value <0.05). A study conducted by Abd-Allah et al\textsuperscript{14} regarding efficacy in term of stress response of oral gabapentin for patients undergoing intracranial surgery, in their study 70 patients were analyzed and the results showed that gabapentin effectively attenuated blood pressure, heart rate, and catecholamine levels compared to the placebo after intubation. A randomized controlled trial by Reddy et al\textsuperscript{15} regarding efficacy of pregablin in attenuating the adverse hemodynamic response to laryngoscopy, In which they demonstrated that pregablin before surgery was very effective for controlling the adverse hemodynamic parameters. Patients received oral pregablin had lower heart rate, systolic and diastolic BP as compared to clonidine Another study conducted by Vadhanan et al\textsuperscript{16} conducted study regarding comparison the effectiveness of oral pregablin with intravenous lignocaine for attenuating stress response in hypertension patients, 60 patients were analyzed, 30 patients received oral pregablin and 30 received intravenous lignocaine before intubation and the study showed that pregablin group had significantly lower heart rate, systolic and diastolic BP as compared to lignocaine group.

Many of previous studies demonstrated that premedication with gabapentin and pregablin showed higher efficacy for attenuating stress response as compared to intravenous medication.\textsuperscript{17,18}

**CONCLUSION**

Oral pregablin had higher efficacy for attenuating stress response as compared to intravenous lignocaine. Oral pregablin had significantly lower heart rate, systolic and diastolic blood pressure when compared to IV lignocaine.

**Author’s Contribution:**

**Concept & Design of Study:** Faiqa Qurban

**Drafting:** Salman Athar Qureshi, Syed Imran ul Hassan

**Data Analysis:** Kanwal Awan, Maryam Liaquat, Yasir Ijaz

**Revisiting Critically:** Faiqa Qurban, Salman Athar Qureshi

**Final Approval of version:** Faiqa Qurban

**Conflict of Interest:** The study has no conflict of interest to declare by any author.

**REFERENCES**


Prophylactic Use of Ketamine and Tramodol for the Prevention of Intra-Operative Shivering in Lower Limb Surgeries Done in Spinal Anesthesia

Mohsin Riaz Askri¹, Shumyala Maqbool2, Syed Imran-ul-Hassan3, Ayesha Ashraf3, Kanwal Awan3 and Maryam Liaqat3

ABSTRACT

Objective: To determine the efficacy of prophylactic intravenous ketamine in the prevention of shivering during spinal anesthesia for elective lower limb surgery.

Study Design: Comparative study.

Place and Duration of Study: This study was conducted at the Department of Anesthesia, Allied hospital, Faisalabad and Anesthesia Department, PIC, Lahore from 30th Oct. 2019 to 30th April 2020.

Materials and Methods: Vital monitoring was done using standard monitoring equipment on hourly basis and later more frequently during the spinal procedure till the next half an hour. Body temperature was noted before, during and after the procedure at regular interval to rule out any hypo- or hyperthermia. The room temperature was controlled and was kept between 24-26°C along with humidification of the theatre. Patients were divided into three groups: first group receiving intravenous (IV) bolus normal saline (Group S, n = 30) or second group of intravenous ketamine 0.5mg/kg (Group K, n=30) and third group of tramadol 0.5mg/kg (Group T, n=30).

Results: No of patients who had intra operative shivering was found to be significantly less in Group K as compared to that in Group S. On further analysis of patients in the Group S, 18 patients had grade 2 shivering level and had to be injected with tramadol after shivering was observed. In Group K, 3 patients reached grade 2 shivering. In Group T, 2 patients reached grade 2 (p<0.001). At 30min after spinal anesthesia, there were no differences between the groups regarding grade of shivering. None of the patients required a second dose of tramadol for grade 2 shivering within 30 min period after spinal anesthesia. Three patients in Group S, one patient in Group K and one patient in Group T had nausea (p>0.05).

Conclusion: Prophylactic intravenous ketamine has a similar clinical efficacy compared to that of intravenous tramadol in preventing shivering during spinal anesthesia in elective lower limb surgery. There were no significant changes in the hemodynamic parameters and adverse effects.

Key Words: Shivering, Intraoperative Shivering, Ketamine, Tramadol


INTRODUCTION

Shivering in patients on operation tables is a very common situation face by surgeons and anesthetists.

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According to an estimate it is seen in around half of the surgeries done on regional anesthesia.¹ This could be a normal phenomenon as part of the thermoregulation system of the body due to hypothermia or as a result of chemokines produced in the body as a result of incisions done. This state of patient’s body could be upsetting for the surgeon as well as for the anesthetist, with an extra stress for the patients as well. Studies have shown that it can increase the oxygen consumption, patient of heart disease can end up into serious complications like organ damage.²

Intra operative Shivering can have drastic effects on the surgical outcomes like prolonged recovery time and increase in the stay in hospital. Even during the surgical procedure, vital monitoring can be disturbed.³,⁴

In line to treat this emerging complication faced by the surgical team, various drug trials had been done worldwide to prevent and/or treat it; still there is no "gold standard" drug identified. Among these
medications, opiates family of drugs along with its adverse effects, are found to be most potent, pethidine being on the top of the list. The adverse effects like respiratory depression, hypotension, sedation, nausea, and vomiting make these drugs difficult to use. The aim of this study was to evaluate and compare the efficacy and safety of prophylactic ketamine for prevention of shivering in elective lower limb surgery done under spinal anesthesia. The drug with better control of shivering will be recommended.

MATERIALS AND METHODS

Department of Anesthesia, Allied hospital, Faisalabad and Anesthesia Department, PLC, Lahore from 30th Oct. 2019 to 30th April 2020. After the approval and informed patient’s consent, 90 cases of age 18 to 60 years falling in the category of American Society of Anesthesiologist (ASA) grade I and II, of either sex, admitted for an elective procedure of orthopedic system using spinal approach of anesthesia were randomized into three groups (using the envelope randomization method).

All patients with a history of a drug therapy taken before the operation which can change the thermoregulation response of the body; all cases with history of alcohol abuse, hypothyroidism or hyperthyroidism, cardiopulmonary disease, psychological disorders, a need for blood transfusion during surgery were excluded.

All patients were given ringer lactate before the start of the procedure as per protocol. Initially it was given at a rate of 10 ml per kg in 30 mins and later reduced to 6ml per kg per hr. Vital monitoring was done using standard monitoring equipment on hourly basis and later more frequently during the spinal procedure till the next half an hour. Body temperature was noted before, during and after the procedure at regular interval to rule out any hypo- or hyperthermia. The room temperature was controlled and was kept between 24-26°C along with humidification of the theatre. Patients were divided into three groups: first group receiving intravenous (IV) bolus normal saline (Group S, n = 30) or second group of intravenous ketamine 0.5mg/kg (Group K, n=30) and third group of tramadol 0.5mg/kg (Group T, no=30).

After taking proper anesthetic measures, intrathecal injection was injected (hyperbaric bupivacaine (0.5%), 3ml) through 25 G Quincke spinal needle between L3-L4 or between L4-L5 interspaces. immediately after intrathecal injection. Treatment drugs were given in diluted form upto 2.5 ml as coded syringes by the primary investigator.

Presence of intra operative Shivering was reported by an observer. Shivering was graded using a scale similar to that validated by Tsai and Chu: [5] 0 for no shivering; 1 for piloerection or peripheral vasoconstriction but no visible shivering; 2 for muscular activity (only one muscle group); 3 for muscular activity in >1 group but not generalized; 4 for shivering involving whole body. During the procedure and during the surgery, the shivering score was noted after each 5 min intervals.

If during the surgery, 15 min after spinal anesthesia and/or along with the prophylactic dose of one of the study drugs, shivering of grade 3 or 4 noted, the prophylactic dose was regarded as ineffective and intravenous tramadol 25mg was administered. Side effects such as hypotension, nausea, and vomiting, and hallucinations were recorded. Hypotension was defined as a decrease in mean arterial pressure of more than 20% from the baseline. If patients develop nausea and vomiting, intravenous metoclopramide 10mg was injected. Hallucination was defined as false sensory experiences irrespective of what was seen, heard, tasted or felt by the patients. The level of sedation was also assessed by the anesthetist with 5-point scale: 1 for fully awake & oriented; 2 for drowsy; 3 for eyes closed but responding on command; 4 for eyes closed but responding on mild physical stimulus; 5 for eyes closed but non responding on mild physical stimulus.

Analysis of the data was done using the SPSS (20). Difference of the means of three groups in regard to age, weight and height were analyzed using variance (ANOVA test). The x2 test was used for the analysis of variables like gender, ASA class, shivering patients, number of patients required analgesics and number of patients with nausea and vomiting. A value of p of < 0.05 was taken as significant. Post hoc comparisons were done using Bonferroni correction of significance level. Power analysis showed that a sample size of 30 per group would be achieving 93% power in the x2 test with a significance level of 0.01 at group proportions of 0.6 and 0.1.

RESULTS

The demographic data and surgical characteristics were similar in each group as shown in the Table no. 1. The preoperative vitals (mean arterial blood pressure and heart rate) and the temperatures were also statistically similar in the three groups. No of patients who had intra operative shivering was found to be significantly less in Group K as compared to that in Group S as shown in the Table no. 2). On further analysis of patients in the Group S, 18 patients had grade 2 shivering level and had to be injected with tramadol after shivering was observed.

In Group K, 3 patients reached grade 2 shivering. In Group T, 2 patients reached grade 2 (p<0.001). At 30min after spinal anesthesia, there were no differences between the groups regarding grade of shivering (Table 2).

None of the patients required a second dose of tramadol for grade 2 shivering within 30 min period after spinal anesthesia. Three patients in Group S, one patient in Group K and one patient in Group T had nausea.
(p>0.05). None of the patients had episodes of oxygen desaturation or respiratory depression during study. No hallucinations, tachycardia, hypotension or hypertension were seen in any of the patients.

**Table No.1: Patient’s characteristic of the three treatment groups**

<table>
<thead>
<tr>
<th></th>
<th>Group S</th>
<th>Group T</th>
<th>Group K</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (yr)</td>
<td>43(18-60)</td>
<td>45 (18-60)</td>
<td>45 (20-60)</td>
</tr>
<tr>
<td>Sex (M/F)</td>
<td>23/7</td>
<td>23/7</td>
<td>24/6</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>67(6)</td>
<td>71(10)</td>
<td>65(9)</td>
</tr>
<tr>
<td>Height (cm)</td>
<td>164(6)</td>
<td>164(8)</td>
<td>162(9)</td>
</tr>
<tr>
<td>ASA I/II</td>
<td>25/5</td>
<td>26/4</td>
<td>26/4</td>
</tr>
<tr>
<td>Duration of surgery (min)</td>
<td>80.3(13.7)</td>
<td>78.0(12.5)</td>
<td>79.9(12.9)</td>
</tr>
<tr>
<td>Shivering grade 2</td>
<td>18</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

Data are given as mean (range), mean (SD) or absolute numbers.

**Table No.2: No. of patients with different grades of shivering in the three treatment groups.**

<table>
<thead>
<tr>
<th></th>
<th>Group S</th>
<th>Group T</th>
<th>Group K</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>T5</td>
<td>18/4/2/6</td>
<td>30/0/0/0</td>
<td>30/0/0/0</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>T10</td>
<td>10/2/12/6</td>
<td>27/1/2/0</td>
<td>25/2/3/0</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>T20</td>
<td>23/1/6/0</td>
<td>28/1/1/0</td>
<td>25/5/0/0</td>
<td>&lt;0.008</td>
</tr>
<tr>
<td>T30</td>
<td>28/2/0/0</td>
<td>30/0/0/0</td>
<td>28/2/0/0</td>
<td>0.088</td>
</tr>
</tbody>
</table>

T5- 5 min after anaesthesia, T10- 10 min after anaesthesia, T20- 20 min after anaesthesia, T30- 30 min after anaesthesia.
P<0.01 between groups S and Group T, P<0.01 between groups S and Group K.

**DISCUSSION**

Intra operative shivering with regional anesthesia is commonly observed by surgeons and anesthetists in the operation theatre. It can be sometimes of the same intensity as that seen during general anesthesia. This intra operative shivering can lead to significant discomfort for the patients and even for the surgeon; with significant worsening of the morbidity in the post-operative period. It can be prevented and managed with the use of skin surfaces warming devices, radiant heaters and/or some pharmological agents. Many other physiological changes in the body can also present as shivering or can be linked to shivering. Most important of these changes is the rise of oxygen consumption to up to 6 times the normal, depleting the cells of oxygen and ending up into cell and tissue death. Additionally, shivering can result in increased heart rate, acidosis, increased intracranial tension, and increased carbon dioxide and stress hormone production. These complications can lead to cardiovascular and neurological deficits, as well as organ damage. Shivering can also disturb the intraoperative monitoring, thus leading to prolong recovery and hospital stay.

Various methods have been used to prevent intraoperative shivering both pharmological and non-pharmological. Among drug 5HT3 receptor antagonist, α 2 receptor agonist, benzodiazepines and opiates have been evaluated for preventing and treating shivering. However, a "gold standard" drug treatment has not been defined so far with 100% efficacy because of the variety of unpredictable adverse effects like fall in blood pressure, sedation, nausea, itching, depression of respiration and vomiting. Some scientists have concluded that these effects can be due to NMDA receptor.

As Ketamine antagonizes the NMDA receptors, it can be used as prophylactic drug to prevent these shivering episodes. Ketamine is easily available agent and has minimal effects on the cardiovascular or respiratory system. Some studies have shown that at a dose of 0.5mg/kg or less ketamine can have no significant sedation and it can prevent shivering. Although the mechanism of ketamine in prevention of intra operative shivering is still not known, but its seems like it could be due to the thermoregulatory changes in the brain and in the body due to different mechanisms like decrease in the core and peripheral heat distribution and prevention of peripheral vasodilatation.

In our study, we observed that in Group S (saline group) 18 patients (60%) reached Grade 2 shivering while only 2 patients (6.66%) in Group T (tramodol group) and 3 patients (10%) in Group K (ketamine group) reached grade 2 shivering. The incidences of side effects were comparative in Group T and Group K although groups did not differ significantly regarding patients characteristics. Studies investigating the anti-shivering role of ketamine and tramadol have shown similar results as our study.

Sagir et al. also found ketamine 0.5 mg/kg IV to be effective in controlling shivering under neuraxial blockade. Dalet al. witnessed significant results with ketamine 0.5 mg/kg i.v. to prevent shivering under general anesthesia. Gangopadhyay et al. concluded that ketamine 0.5 mg/kg i.v. was effective in preventing shivering under spinal anesthesia. Ketamine is known to cause hallucinations, but none of the patients complained of hallucination in any of the groups. Tramadol has the potential to cause nausea and vomiting, but the incidence of nausea and vomiting in the study groups was comparable with the ketamine group. Similar results are reported in the literature.

**CONCLUSION**

Prophylactic intravenous ketamine has a similar clinical efficacy compared to that of intravenous tramadol in preventing shivering during spinal anesthesia in elective
lower limb surgery. There were no significant changes in the hemodynamic parameters and adverse effects.

**Author’s Contribution:**

**Concept & Design of Study:** Mohsin Riaz Askri

**Drafting:** Shumyala Maqbool, Syed Imran-ul-Hassan

**Data Analysis:** Ayesha Ashraf, Kanwal Awan, Maryam Liaquat

**Revisiting Critically:** Mohsin Riaz Askri, Shumyala Maqbool

**Final Approval of version:** Mohsin Riaz Askri

**Conflict of Interest:** The study has no conflict of interest to declare by any author.

**REFERENCES**


Follicular Unit Hair Restoration Leads to Better Management of Burn and Androgenic Alopecia
Abdul Khaliq¹, Zarish Danie¹ and Naima Javed²

ABSTRACT

Objective: To determine the efficacy of follicular unit transplantation for androgenic and post burn restoration of hair of beard, scalp hair, side locks and frontal hairline at tertiary care Hospital.

Study Design: Descriptive study

Place and Duration of Study: This study was conducted at the Islamabad Cosmetic Surgery and Department of Plastic Surgery PIMS Islamabad from February 2017 to January 2019.

Materials and Methods: Patients presented with scalp burn and androgenic alopecia, age >12 years and either of gender were included. Follicular unit extraction was used for hair restoration, where natural follicles contain 1, 2 or 3 hair and each extracted individually with a 0.9 mm motorized punch and then implanted as hair follicular micro grafts. Follicular unit transplant (FUT) was based on excision of a strip of the scalp to yield hair follicles. Patients underwent the procedure during 2-3 sittings that is spaced 8-10 months apart. Efficacy was recorded in terms of patient’s satisfaction. Data was entered in self-made proforma.

Results: Total 78 patients were studied their mean age was 28.23±6.11 years. Males were in majority 61.5%. Out of all 38.5% of grafts grew during 5-6 months, 41.0% of grafts grew in 7-8 months and remaining grew in around 10 months. Survival rate was 84.6% and non-survival rate was 15.4%. Most of the patients were satisfied.

Conclusion: Follicular unit transplantation for post burn and androgenic restoration of hair showed best efficacy with excellent survival rate and patients satisfaction. Follicular unit micro skin grafting imparts natural looking layout and replacement for hair restoration of eyebrows, eyelashes, beard, moustache, side burns, hairlines or scalp hair and less noticeable surgical scars.

Key Words: Burn Alopecia, Follicular Unit Hair Transplantation


INTRODUCTION

The reconstruction of facial esthetics of the post burn patients is very important so that they may return towards social life. The reconstruction of eyebrows, scalp hair, frontal hairline, eyelash, side locks or a beard around the chin and moustache animates the face, boosts confidence and breaks the vicious cycle of self-pity, while giving the feeling of camouflage for the scars and completeness.¹

The cause of the hair loss in burns is primarily due to deep burns that may involve follicles or from excessive fibrosis, which then strangulates the follicles while cicatricle alopecia.

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The restoration of the hair is reserved as the last treatment; after all the other functional problems have been solved. The scar of the burn must be mature, mobile, not stuck to the underlying bone when hair transplantation is considered. There are various methods in the management of post burn scalp defects and the clinical observations led to guidelines for covering up of scalp defects or hair loss scars of burn on the scalp.¹ ² ³ The primary closure after excision or scalp reduction, for defects that are away from the hairline, measuring almost 20% of the scalp with almost 85% normal scalp available for closure and undermining could still lead to scar hypertrophy or may cause gradual stretching of the scar.² Rotation flap, multiple banana peel flaps or transposition flap can be used for burn scars covering up to 40% of the scalp with 70% of normal scalp for movement and planning of the flaps.³ Tissue expanders, on the other hand, can be used for burn scars covering up to 50% of the scalp with almost 50-60% of normal scalp for expansion.⁴ While Micro grafting has the advantage to be used for hair less areas with up to 60% of the scalp with at least, 50% normal hair, for donor harvesting. With this technique defects of more than 60% can be covered by using body hair especially beard hair, next best is the chest hair. The larger areas on the scalp can also be
managed, creating a natural hair line on front, or using a wig or hair piece for the rest of the scalp.\(^2\) All of the post burn scars on the scalp, from 10% to 65%, can easily be transplanted with using the technique of follicular unit micro grafts. In patients having burn alopecia or hair loss, their treatment can often be a challenge to patients and surgeons both. Recent surgical techniques of hair transplant via follicular unit extraction of strip follicular unit transplant has become the choice treatment for alopecic areas that needs more advanced consequences.\(^3\) Beard, scalp, eyelash and eyebrow hair loss have adverse impact on the burn survivors self-stream and even if surgery is not an option.\(^4\) However current study was based on post burns hair restoration by follicular unit extraction with a follow-up of 9 months to 2 years

**MATERIALS AND METHODS**

This descriptive study was conducted at Islamabad cosmetic surgery and department of plastic surgery of PIMS Islamabad with duration of 2 years, during February 2017 to January 2019. Patients those having burn and androgenic alopecia, age >12 years and either of gender were included in the study. Patients those having infection, diabetes, open wound and those were agreeing to participate in the study were excluded. Inform consent was taken from the patients. Patients underwent complete medical history and clinical examination accompanied by required laboratory investigations including complete blood count, bleeding time (BT), clotting time (CT) and prothrombin time. Method of follicular unit extraction (FUE) was used for hair restoration in post burn patients, where the natural follicles that may contain 1, 2 or 3 hair each are extracted individually with a 0.9 mm motorized punch and then implanted as hair follicular micro grafts. Other technique for occasional Hair Transplant surgery was follicular unit transplant (FUT) that is based on excision of a strip of the scalp to yield hair follicles. A 1.2 cm wide × 6, 10, 12,14, 15 cm long strip was taken from donor dominant scalp portion at the level of the occipital protubrance. Depth of the strip was kept to the sub-dermal level. The Scalp defect was then closed in two layers. The strip of the scalp taken is then slivered along the width of the recipient area, into rows of hair containing 10-12 follicles each. Each one of these is dissected to yield natural follicular units having 1, 2 or 3 hair. These units of the donor portion were the hair grafts that were implanted with a layout, pattern and angle to match the hair in the area of hair restoration. Each of this follicular hair unit survives like a skin graft. In graft placement method, the hair grafts first loaded into the needle tip of implanter device and then pushed in place with the help of a plunger, or follicle micro grafts be implanted using premade slits with chisel blades, in to which the grafts are placed or sub dermic needle punctures are made by other hand, and grafts are then placed immediately in the needle tracks while grabbing a forceps in the right hand, this is called “Stick and Place”. In the patients of post burn scars the spacing of the hair grafts was at 2-4 mm apart to good graft survival achievement. Efficacy was evaluated in terms of amelioration of scar area and patients satisfaction. Amelioration of scar area was categorized according to percentage of amelioration as; 0%–25% fair, 26%–50% moderate, 51%–75% good, 76%–100% excellent.\(^5\) Patients satisfaction was evaluated by Likert scale as; 0 for unsatisfied, 1 for slightly satisfied, 2 for indecisive, 3 for satisfied, and 4 for very satisfied.\(^6\)

**RESULTS**

**Table No.1 Demographic characteristics of the patients n=78**

<table>
<thead>
<tr>
<th>Variables</th>
<th>No. of cases (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>48 (61.5%)</td>
</tr>
<tr>
<td>Female</td>
<td>30 (38.5%)</td>
</tr>
<tr>
<td><strong>Area Requested</strong></td>
<td></td>
</tr>
<tr>
<td>Eye lashes</td>
<td>07 (9.0%)</td>
</tr>
<tr>
<td>Eye brows</td>
<td>15 (19.2%)</td>
</tr>
<tr>
<td>Scalp area</td>
<td>30 (38.5%)</td>
</tr>
<tr>
<td>Frontal hairline</td>
<td>09 (11.5%)</td>
</tr>
<tr>
<td>Beard area</td>
<td>06 (7.7%)</td>
</tr>
<tr>
<td>Side locks and temporal area</td>
<td>05 (6.4%)</td>
</tr>
<tr>
<td>Moustache</td>
<td>06 (7.7%)</td>
</tr>
<tr>
<td><strong>Age (mean±SD)</strong></td>
<td>28.23±6.11years</td>
</tr>
</tbody>
</table>

**Table No.2: Growth duration of implanted grafts in burn areas and survival rate n=78**

<table>
<thead>
<tr>
<th>Variables</th>
<th>No. of cases (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Growth duration</strong></td>
<td></td>
</tr>
<tr>
<td>5-6 months</td>
<td>30 (38.5%)</td>
</tr>
<tr>
<td>7-8 months</td>
<td>32 (41.5%)</td>
</tr>
<tr>
<td>9-10 months</td>
<td>16 (20.5%)</td>
</tr>
<tr>
<td><strong>Survival rate</strong></td>
<td></td>
</tr>
<tr>
<td>Survival</td>
<td>07 (9.0%)</td>
</tr>
<tr>
<td>Failure</td>
<td>73 (96.4%)</td>
</tr>
</tbody>
</table>

**Figure No.1. Satisfaction of the patients n=78**
Total 78 patients were studied; their mean age was 28.23±6.11 years. Males were in majority 61.5% and females were 38.5%. Most of the patients 38.5% presented with scalp area, followed by eye brows 19.2%, frontal hair line 11.5%, eye lashes 9.0%, beard area 7.7%, side locks and temporal area 6.4% and moustache was in 7.7% patients. Nine percent of the cases were corrected in the first sitting, 60(76.9%) required two sittings and the remaining were corrected within three sittings Table.1 The growth of the implanted grafts in burn areas was delayed. All the grafts did not show equal growth, 38.5% of grafts grew around 5-6 months, 41.0% of grafts grew in 7-8 months and the remaining grew in around 10 months. Survival rate was 93.6% and non-survival rate was 6.4%. Fig.1

Most of the patients 43.6% were very satisfied and 41.0% were satisfied, while 7.7% were unsatisfied, 5.1% were slightly satisfied and 2.6% were indecisive. Table.2

**DISCUSSION**

Burn injuries, may cause by scalds (including steam, hot water and cooking oils), electrical injury, by chemical or flame, may be isolated to the head and neck areas or be a part of injuries affecting a larger total body surface area. Hair follicular destruction is typically linked to deep burns, the nature of which also results in severe scarring and which makes hair transplantation more challenging. In this study males were in majority 61.5% and females were 38.5% and patients mean age was 28.23±6.11 years. Similarly, Mohmand MH et al reported that males were in majority as compared to females and patients' mean age was 28.53 years. While inconsistently Tayyaba F et al reported that males were 26.67% and females were 73.33% with average age of 21 years.

In this study, most of the patients (38.5%) presented with scalp area, followed by eye brows (19.2%), frontal hair line (11.5%), eye lashes (9.0%), beard area (7.7%),
side locks and temporal area (6.4%) and moustache in 7.7% of cases. Rajput R et al\textsuperscript{12} stated that follicular unit micro grafting can be used for restoration of eyebrows, eyelashes, moustache, beard, side burns, hairlines or scalp hair. El Sakka DM et al\textsuperscript{13} also found females in majority (63.33\%) as compared to males (36.66\%). This gender difference may due difference in sample selection because in this study androgenic alopecia was more. In this study, all the grafts did not show equal growth, 38.5\% of grafts grew in around 5-6 months, 41.0\% of grafts grew in 7-8 months and the remaining grafts grew in around 10 months. However, Rajput R et al\textsuperscript{12} stated that 9\% patients were corrected in around one sitting, 77\% required two sittings, and 14\% required three sittings for satisfactory restoration. In burn scars, patients and surgeons had to wait due to poor circulation. Distortion of angle and wavy growth appeared with grafts implanted in post burn scars. This is due to the fibrosis in the bed and adherence between the tissue layers. The distortion will be less pronounced in the subsequent hair cycles and the hair will set gradually well in the next 8-10 months. Initially, the hair growing out is squeezed through the scar.\textsuperscript{12}

In this study survival rate was 93.6\%. Mohmand MH et al\textsuperscript{9} observed that survival rate of FU transplants ranged from 70 to 90\%, with an average of 80.67\%. On the other hand, Tayyaba F et al\textsuperscript{13} reported that total reconstruction of post burn alopecia was achieved in around 90\% of cases. Beehner et al\textsuperscript{14} compared FUE and FUT, and survival rates were 86\% and 61.4\% respectively after 14 months. Lee SJ et al\textsuperscript{15} also reported that mean survival rate of total number of hair transplantations was 92.0 to 90.4\% after six to nine months of transplantation. Jung S, et al\textsuperscript{16} stated that follicle transplantation showed excellent results in 44.4\% of cases, good results in 38.9\%, fair in 11.1\%, and poor in 5.6\% of cases. In this study, most of the patients (43.6\%) were very satisfied, 41.0\% were satisfied and 5.1\% were slightly satisfied, while 7.7\% were unsatisfied and 2.6\% were indecisive. While, Civas E et al\textsuperscript{1} also reported that 86.7\% were satisfied and 13.3\% of patients were very satisfied. We agreed with the statement of Civas E et al that satisfaction or dissatisfaction of the patients may also be related to the knowledge about the natural hair (i.e., quality, direction, and density) which had been present in the recipient scar area prior to the development of cicatricial alopecia,\textsuperscript{7} and another important factor that increases patient’s satisfaction with the hair transplantation treatment of I alopecia is the acquisition of thorough information about the treatment and realistic expectations from the procedure before the operation.\textsuperscript{7} Future studies are needed on this treatment option by taking patients’ satisfaction in consideration.

CONCLUSION

Follicular unit transplantation for restoration of hairs showed best efficacy with excellent survival rate and patients satisfaction. Follicular unit micro skin grafting imparts natural looking layout and replacement for hair restoration of eyebrows, eyelashes, beard, moustache, side burns, hairlines or scalp hair and less noticeable surgical scars are another advantage of follicular unit extraction. The technique is the time consuming, repetitive and labourous but the outcome is the satisfying for the doctors and patients both.

Author’s Contribution:

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Drafting: Zarish Daniel
Data Analysis: Naima Javed
Revisiting Critically: Abdul Khaliq, Zarish Daniel
Final Approval of version: Abdul Khaliq

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES
